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ABSTRACT

Research on child and adolescent conduct problems has proliferated over the past 15 years, resulting in an extensive array of risk factors, processes, and targets for intervention. To capitalize fully on this extensive research base and contribute effectively to public mental health, the field now needs to take stock of what is known about child and youth conduct problems. In 1998, The National Institute of Mental Health (NIMH) began a process known as "Taking Stock of Risk Factors for Child/Youth Externalizing Behavior Problems." "Externalizing behavior problems" refers to a range of rule-breaking behaviors and conduct problems, including physical and verbal aggression, defiance, lying, stealing, truancy, delinquency, physical cruelty, and criminal acts. The "taking stock" process involves three key objectives: (1) to identify and describe what is known about risk factors and processes that contribute to externalizing behavior problems; (2) to identify gaps in our knowledge about risk factors and processes; and (3) to describe the kinds of research and research methodologies needed to advance the field. This report provides a summary of the first of these objectives--describing what is known about existing risk factors and processes that contribute to externalizing behavior problems. This report provides a summary of expert consensus and evaluation of what is currently known about the factors and processes that contribute to the initiation, enhancement, prevention, and termination of conduct problems in children and youth. Specific information about the research studies that document these findings can be found in the accompanying tables. (Contains 285 references and 4 tables.) (GCP)

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Taking Stock

of Risk Factors for Child/Youth Externalizing Behavior Problems

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Introduction

Research on child and adolescent conduct problems has proliferated over the past 15 years, resulting in an extensive array of risk factors, processes, and targets for intervention. To capitalize fully on this extensive research base and contribute effectively to public mental health, the field now needs to take stock of what is known about child and youth conduct problems. In 1998, The National Institute of Mental Health (NIMH) began a process known as "Taking Stock of Risk Factors for Child/Youth Externalizing Behavior Problems." "Externalizing behavior problems" refers to a range of rule-breaking behaviors and conduct problems, including physical and verbal aggression, defiance, lying, stealing, truancy, delinquency, physical cruelty, and criminal acts. A diagnosis of conduct disorder can be made when these conduct problems become repetitive and persistent and occur in a variety of settings, such as home, school, or community (American Psychiatric Association, 1994). The "taking stock" process involves three key objectives: (1) to identify and describe what is known about risk factors and processes that contribute to externalizing behavior problems; (2) to identify gaps in our knowledge about risk factors and processes; and (3) to describe the kinds of research and research methodologies needed to advance the field.

This report provides a summary of the first of these objectives—describing what is known about existing risk factors and processes that contribute to externalizing behavior problems. To accomplish this objective, four primary domains of risk were identified: child characteristics; family factors and processes; peer influences; the broader social environment, communities, and schools.

Within each domain, leading experts were convened in small groups (typically six to eight experts) to summarize the risk factors and processes. (A list of experts involved in these groups is included at the beginning.) Each group met for a day and a half to discuss which factors were most well-documented and "known" by the field. Through a consensus process, each small group "took stock" and identified the most well-established risk factors and processes in a given domain. To document these factors, each expert was asked to identify, evaluate, and summarize a minimum of three key references for each factor. All evaluations used a framework developed by Kraemer et al. (1997) to describe three types of risk factors. At the most basic level, factors can be *correlates* when shown to occur concurrently with externalizing behavior problems. Next, factors that are found to reliably precede behavior problems can be described as *predictive risk factors*. Finally, factors that can be manipulated through experimentation or intervention and shown to lead to changes in behavior problems can be described as *causal risk factors*. It is important to note that this framework also implies a "developmental course" to risk factor research. Once factors are found to be correlated with outcomes, further research should document the potential for prediction and, ultimately, the potential for causation. Causal risk factors then become the empirical foundation for building effective interventions.

This report provides a summary of expert consensus and evaluation of what is currently known about the factors and processes that contribute to the initiation, enhancement,

prevention, and termination of conduct problems in children and youth. Specific information about the research studies that document these findings can be found in the accompanying tables. Although in some cases more than or fewer than three references were evaluated, in general, the tables were limited to three entries per factor.

It is important to note that this summary is not intended to be a complete literature review of all factors related to externalizing behavior problems and conduct disorder. Instead, the summary provides an integrated overview of what experts in the field regard as the most well-studied factors and processes and further evaluates these factors in terms of their status as correlates, predictive risk factors, or causal risk factors. The objective of the summary is to document what is known about externalizing behavior problems and conduct disorder in order to highlight what causal risk factors are already known and can be used in interventions, as well as which factors need further research to document their potential for prediction and causation. The expert consensus and evaluation process used to develop this summary was considered a richer and more expeditious route to accomplishing this objective than a comprehensive literature review. In addition, this summary is limited to research on child and adolescent externalizing behavior problems and conduct disorder. Although there is some overlap between externalizing behavior problems and violence, the current summary is not intended as a complete review of all forms of youth aggression, violence, and antisocial behavior. Readers interested in this broader field of research are referred to recent reviews and edited volumes (Coie & Dodge, 1997; Loeber & Farrington, 1998; Stoff, Breiling, & Maser, 1997; U.S. Department of Health and Human Services, 2001).

Development of Externalizing Behavior Problems

Before reviewing the status of risk factors, it is important to consider how externalizing behavior problems change over development. In the past 20 years, several longitudinal studies have provided a picture of the changing forms of aggression and conduct problems from early childhood through adolescence (Cairns & Cairns, 1994; Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Patterson, Reid, & Dishion, 1992). Their findings converge to suggest that no single child characteristic or situation can account for the development of externalizing behavior problems. Rather, these problems result from interactions between characteristics of the child and situations within the family, peer group, school, and community. Some research suggests that there are two entry points to developing externalizing behavior problems—in early childhood and in early adolescence—with potentially different patterns of risk factors associated with each (Bartusch, Lynam, Moffitt, & Silva, 1997; Hinshaw, Lahey, & Hart, 1993; Moffitt, 1993). Children who exhibit persistently high levels of externalizing behavior problems early in their lives are at high risk for intensifying to lying, bullying, and fighting in middle childhood, and more serious behaviors such as cruelty to animals, vandalism, and aggressive criminal behaviors in adolescence. A significant number of these antisocial youth continue to exhibit correlated problem behaviors (e.g., drug use, precocious sexual activity) throughout adolescence and into adulthood, although the types of difficulties experienced by antisocial boys and girls tend to diverge with development.

In contrast to children with an early onset of externalizing behavior problems, some youth begin to exhibit problem behaviors during early adolescence. Their entry into conduct problems

generally occurs through associations with deviant peers. Initial data on these "late starters" suggest that much of their antisocial behavior tends to be nonaggressive and that they are more likely to desist in problem behaviors as they become older. However, other ongoing research is suggesting that some late starters may be involved in highly aggressive and problematic behaviors. Additional research is needed to fully understand the pathways and outcomes for late starters.

It is important to note that the early starter/late starter model of two developmental pathways for externalizing behavior problems is controversial. Several research groups are actively examining data to detect other potential pathways, as well as distinct developmental patterns related to child gender. However, this two-pathway model is important because it incorporates the notion that behaviors exhibited by children with conduct problems differ with development and changes in the social environment. The basic forms of externalizing behavior problems evident in early childhood, middle childhood, and adolescence are summarized below.

Early Childhood

Most children engage in rule-breaking and defiant behaviors during early childhood (ages 2–6); therefore, this is the stage of life at which externalizing behaviors are at their peak. During the early years, the primary manifestations of externalizing behavior problems include noncompliance, oppositional behaviors, and overt physical and verbal aggression. With developing cognitive, language, and social abilities, most children replace their aggressive problem-solving strategies with prosocial ones. A small minority of children continue to engage in high rates of externalizing behavior and exhibit these behaviors (e.g., coercive interactions with parents, hitting young peers) in home and school settings. Children

who show early and persistent externalizing behavior problems and who experience additional psychiatric and academic problems (e.g., attention deficit hyperactivity disorder [ADHD]) are at highest risk for developing serious delinquency and engaging in juvenile crime in adolescence. Thus, children who, from an early age, show persistent externalizing behavior problems appear to be developing along the early onset pathway for conduct problems, failing to learn prosocial ways of interacting with others, and laying the foundation for continuing problematic behaviors.

Middle Childhood

With the increased cognitive and social sophistication of middle childhood (ages 7–13), children expand their repertoire of conduct problems from those that are evident to observers (i.e., overt, direct) to those that are hidden or secretive (i.e., covert, indirect, relational). Both boys and girls who are aggressive are at risk for being actively rejected and marginalized by their peers. When evaluating their social encounters, these children are often likely to attribute hostile intent to others. Although coercive family interactions may continue and escalate, processes within the peer group gain in importance in continuing the development of externalizing behavior problems.

Adolescence

Externalizing behavior problems can intensify during adolescence, when peer influences enhance the diversity of rule-breaking behaviors to include delinquent and antisocial behaviors (e.g., vandalism, theft, assault), substance use, and, in some cases, gang involvement and drug dealing. For many antisocial young men and women, there is a developmental acceleration into precocious

sexual activity and sexual promiscuity. Of these antisocial youth, a small proportion will intensify their aggressive behaviors and commit serious violent offenses.

Given what is known about the developmental course of externalizing behavior problems, it is clear that behaviors targeted for intervention, as well as the immediate expected outcomes from such interventions, will differ depending on the age of the children involved. Also, because externalizing behavior problems have not been found to be attributable to a single source or situation, interventions for changing these behaviors need to focus on multiple risk factors across multiple settings. Similarly, the relative contribution of individual risk factors may change with development, suggesting different targets for interventions at different ages. What are the multiple risk factors and situations that should be targeted in interventions? Are there additional developmental pathways other than the early and late starter pathways? These are questions of tremendous importance to the field, with equally important ramifications for public mental health. To advance this research, however, it is important to review and take stock of what is known currently about the many risk factors for externalizing behavior problems and to use this information when considering which combinations and interactions of factors hold greatest promise for understanding and decreasing child and adolescent externalizing behavior problems. The sections that follow summarize what is currently known about risk factors in four domains: child characteristics; family factors and processes; peer influences; the broader social environment, communities, and schools.

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Child Characteristics

A number of child characteristics have been shown to be associated with high levels of externalizing behavior problems. These characteristics span multiple aspects of the individual, including behavioral, emotional, and cognitive functioning; autonomic, neuroendocrine, and neurochemical systems; and prenatal conditions and genetics. The conclusion that emerges is that conduct problems likely involve difficulties in regulation across behavioral, emotional, cognitive, and biological functioning. However, the extent to which problems in regulation of one aspect of functioning (e.g., emotional) affect the ability to regulate another aspect (e.g., biological) or how development of regulation in any one affects other aspects is not known.

Behavioral and Emotional Factors

A number of behavioral and emotional characteristics have been hypothesized to play a role in externalizing behavior problems. One prospective longitudinal study found that the display of empathic, sympathetic, and prosocial behaviors in childhood predicts a lower risk of conduct problems in early adolescence (Tremblay, Pihl, Vitaro, & Dobkin, 1994). This work is supported by research using concurrent designs showing that children and youth with conduct problems perform more poorly on measures of empathy compared with normal children and youth (Cohen & Strayer, 1996; Eisenberg et al., 1996; Miller & Eisenberg, 1988).

Research on child emotionality has focused on two forms of early emotional/behavioral characteristics: difficult-irritable-oppositional and shy-inhibited. Several longitudinal studies have found that a pattern of difficult-irritable-oppositional behavior during early childhood predicts increased risk for later externalizing behavior problems in childhood and adolescence (Bates, Pettit, Dodge, & Ridge, 1998; Caspi, Moffitt, Newman, & Silva, 1996; Guerin, Gottfried, & Thomas, 1997). The strength of these associations typically falls in the moderate range (Cohen, 1988).

In addition, several longitudinal studies have found that a pattern of inhibited behavior during early childhood predicted decreased risk for later antisocial behavior (Raine, Reynolds, Venables, Mednick, & Farrington, 1998; Tremblay et al., 1994). However, other studies have found that behavioral inhibition in early childhood predicted either later aggression or later increased antisocial behavior (Caspi et al., 1996; Goldsmith, 1996). Clearly, more research is needed on the influence of early behavioral inhibition.

Complementing this work on emotionality is newer research examining behavioral and attentional regulation (i.e., a child's ability to maintain calm, purposeful action and attention rather than acting in daring, impulsive, and poorly controlled ways). This research indicates that childhood daring and impulsive behaviors (i.e., lack of regulation) (Farrington & Hawkins, 1991), particularly when combined with irritable emotionality, are predictive risk factors for later adolescent antisocial behavior (Eisenberg et al., 2000). Both behavioral and

attentional regulation contribute to this finding, and the pattern of relations, while low-moderate in predictive strength, has been found in the United States (Lengua, West, & Sandler, 1998) and New Zealand (Henry, Caspi, Moffitt, & Silva, 1996).

Cognitive Factors

Research on ADHD provides further information about the role of attention and other cognitive processes in the development of externalizing behavior problems. A number of studies have documented that boys who meet criteria for ADHD in childhood are at increased risk for conduct disorder and antisocial behavior in adolescence and early adulthood (Mannuzza et al., 1991). However, when comorbid oppositional defiant behavior is measured, some evidence suggests that increased risk for conduct disorder is correlated with early oppositional defiant behavior rather than ADHD (Biederman et al., 1996; Moffitt, 1990). Thus, while the evidence indicates an association between ADHD and conduct problems, it is not clear whether ADHD operates as a predictive risk factor or a moderator.

In trying to clarify the implications of ADHD, researchers are incorporating indices of basic cognitive functioning and development, specifically executive function and inhibitory control processes. Executive function refers to the ability to take in information, formulate plans of action and thinking, and execute behaviors consistent with these plans. Involved in this process is the ability to exert inhibitory control, that is, to inhibit other sources of information and other incompatible behaviors.

There is some debate as to whether executive function and inhibitory control are relevant to conduct disorder or whether they are best thought of as related to ADHD and, therefore, pertinent only in instances of comorbid conduct disorder and

ADHD. However, recent studies using improved measures of these cognitive processes and refined sampling techniques have indicated that inhibitory control is correlated with conduct disorder, even in the absence of ADHD (Oosterlaan, Logan, & Sergeant, 1998; Oosterlaan & Sergeant, 1996). Children with more persistent or pervasive conduct problems seem more likely to demonstrate deficits in executive function and inhibitory control. These associations appear to be relatively independent of IQ and other cognitive functions, such as memory (Seguin, Boulerice, Harden, Tremblay, & Pihl, 1999). This independence of effect from IQ is particularly important because a large number of studies have found lower IQ and verbal abilities to be predictive risk factors for later antisocial behavior (Fergusson & Horwood, 1995; Stattin & Klackenberg-Larsson, 1993; White, Moffitt, & Silva, 1989). Note, however, that much of the research on executive function is based on concurrent assessments of cognitive functioning and problematic behavior. Additional research is needed to identify the predictive associations and potential causality of these processes for conduct problems.

Related to IQ and verbal abilities is a young person's academic achievement. Research consistently documents low correlations between poor academic performance and externalizing behavior problems (Maguin & Loeber, 1996). Again, it has been difficult to determine if this association holds for children who show conduct problems in the absence of ADHD; several studies show correlations among poor academic achievement, conduct, and attention problems, but weak or no relationships between poor academic achievement and conduct problems alone (Frick et al., 1991). However, children who develop conduct problems in middle childhood are at increased risk of later negative educational outcomes, including early school dropout (Fergusson & Horwood, 1998). Thus, the direction of effects between academic achievement and externalizing behavior

problems may be complex and may change across development.

In contrast to research on basic cognitive functioning and academic achievement, strong evidence exists about the role of social information processing as both a predictive and a causal risk factor for externalizing behavior problems. Findings from prospective longitudinal studies (Dodge, Bates, & Pettit, 1990; Dodge, Pettit, Bates, & Valente, 1995) and intervention studies (Hudley & Graham, 1993) provide clear evidence that biased social information processing—that is, the tendency to attribute hostile intentions to others—predicts and is a causal risk factor for the development and maintenance of physically aggressive behavior patterns. Similarly, initial studies suggest that biased social information processing may be involved in the development of other forms of aggressive behavior (e.g., relational aggression) (Crick, 1995). The work on relational aggression, however, has progressed only to the extent of finding concurrent associations.

Consistent evidence also documents modest correlations between conduct problems and problems in moral reasoning and social problem solving. When faced with interpersonal conflicts or social dilemmas in an experimental situation, aggressive preschool and elementary school-aged children are more likely than their nonaggressive age-mates to recommend using aggressive, manipulative, and/or commanding strategies for resolving problems (Rubin, Bream, & Rose-Krasnor, 1991; Rubin, Moller, & Emptage, 1987). Among older youth and adults, delinquent and antisocial behavior is correlated with poorer and less sophisticated moral reasoning abilities (Gregg, Gibbs, & Basinger, 1994; Nelson, Smith, & Dodd, 1990; Trevethan & Walker, 1989). Additional research is needed to determine whether social problem solving and moral reasoning abilities predict or follow externalizing behavior problems or whether improvements in these abilities can lead to improvements in externalizing behaviors.

Autonomic Factors

Another aspect of child functioning that has been related to emotional and behavioral regulation is the autonomic system, particularly indices of heart rate. Lowered heart rate and dampened heart rate variability are consistently correlated with disruptive and antisocial behaviors from early childhood through adolescence and adulthood (Mezzacappa et al., 1997). These autonomic measures have been found to predict later aggression in childhood (lower heart rate or vagal tone) (Raine, Venables, & Mednick, 1997), and the ceasing of antisocial behavior in young adulthood (higher heart rate) (Raine, Venables, & Williams, 1995). These data, however, are limited to males, because only a few studies have examined links between heart rate and externalizing behavior problems in girls. Additional research is needed to document whether heart rate regulation indices predict the onset and persistence of diagnosed conduct disorder.

Neuroendocrine Factors

Hormones produced by the hypothalamic-pituitary-adrenal axis appear to be related to the pathophysiology of externalizing behaviors, based on correlational studies. Basal levels of cortisol tend to correlate negatively with indices of childhood externalizing behavior (McBurnett, Pfiffner, Capasso, Lahey, & Loeber, 1997; Moss, Vanyukov, & Martin, 1995). Also, there is evidence that increased cortisol reactivity (changes in level) predicts conduct problems one year later among adolescents (Susman, Dorn, Inoff-Germain, Nottelmann, & Chrousos, 1997). Additional research is needed that employs consistent methods and procedures for collecting basal cortisol and monitoring cortisol reactivity (a likely contributor to inconsistent findings) in long-term longitudinal studies to determine the direction of effects.

The hypothalamic-pituitary-gonadal axis is responsible for producing gonadotropin-releasing hormones (LHRH), the gonadotropins (luteinizing hormone and follicle stimulating hormone), and sex steroids (testosterone, estrogen, and progesterone). The findings for these hormones and sex steroids vary across ages and studies. Specifically, no single study or group of studies establishes the relationship between LHRH and gonadotropins and externalizing behavior problems. There is evidence that higher testosterone correlates with greater aggression and irritability during adolescence (Olweus, Mattsson, Schalling, & Low, 1988). In one randomized double-blind experiment with youth experiencing pubertal delay, boys and girls who were administered mid-level doses of testosterone and estrogen, respectively, showed increased aggressive behavior compared with those receiving placebo (Finkelstein et al., 1997). However, developmental differences were suggested, with stronger patterns of association found between testosterone and externalizing behavior in older adolescents boys than in younger adolescents. Given the small sample size for this study, additional research is needed to clearly understand potential effects. In addition, few studies have included measurement of estrogen and other sex steroids.

Neurochemical Factors

In comparison to many of the other areas of influence discussed in this report, evidence for the influence of regulation of brain neurochemicals on externalizing behaviors is not as clear or abundant. Two neurochemical systems, serotonin and dopamine, have been studied. Serotonin is a regulatory neurotransmitter that can be involved in inhibitory responses to stimuli. Evidence relating the serotonergic system with externalizing behavior is derived from both animal and human studies. There is some indication that enhanced serotonergic activity in early childhood correlates

with increased externalizing behavior (Halperin et al., 1997; Kruesi et al., 1992; Pine et al., 1997). This statement, however, is only tentative. Few studies have been done with children and young adolescents. The studies to date have included small and unrepresentative samples. Also, this research is complicated by differences in measurement strategies across studies (cerebrospinal fluid indexes versus peripheral indexes following pharmacological challenge) that make cumulative interpretations difficult.

The empirical evidence to support the role of dopamine in externalizing behavior in humans also is not well developed. Limited studies with children provide unclear findings. Lower levels of homovanillic acid (the metabolite of dopamine) (Limson et al., 1991) and lower levels of dopamine beta-hydroxylase (D β H, the enzyme facilitating conversion of dopamine to norepinephrine) were correlated with externalizing behavior (Galvin, Stilwell, & Shekher, 1997). However, a positive relationship was found between plasma D β H and disinhibition and sensation seeking (Kuperman, Kramer, & Loney, 1988). Overall, the functioning of the dopaminergic and serotonergic systems has not been sufficiently researched to draw conclusions about their contribution to externalizing behavior problems.

Prenatal Conditions and Genetic Factors

Several prenatal conditions associated with adverse reproductive outcomes also have been associated with externalizing behavior problems in offspring. These include young maternal age, smoking, and alcohol and drug use during pregnancy. It is important to note that this area of research is challenged by the extent and complexity of co-occurring factors (e.g., low socioeconomic status [SES], violence in the environment, family

conflict). Sorting out these confounding factors is extremely difficult and requires caution in drawing inferences about causal relationships.

Given these difficulties, there is substantial evidence that offspring of mothers who give birth earlier in life are more likely to have externalizing behavior problems during childhood and adolescence (Christ et al., 1990; Fergusson & Lynskey, 1993; Spieker, Larson, Lewis, White, & Gilchrist, 1997). This predictive association between maternal age and child conduct problems still holds even when maternal and paternal conduct problems, substance use, perinatal factors, demographic factors, parent-child interactions, and related variables have been controlled in regression analyses (Fergusson & Lynskey, 1993; Wakschlag et al., 1997). Although it is not clear how maternal age is related to child behavior problems, at least two kinds of variables can be hypothesized as mediators. First, having a child earlier in life often restricts maternal educational and occupational attainment and related life circumstances, such as neighborhood of residence, that are associated with youth conduct problems and crime (see the Broader Social Environment, Communities, and Schools section). Second, less mature mothers may be more likely to raise their children in ways that may foster conduct problems, such as use of harsh and inconsistent discipline (see Family Factors and Processes section). Also, other as-yet-unknown biological variables, environmental variables, or both may mediate this relationship.

In addition to maternal age, consistent evidence exists that prenatal maternal smoking is a predictive risk factor for later child conduct problems. Evidence from methodologically strong epidemiological and clinical studies in several countries has found maternal cigarette smoking during pregnancy to predict inattention and impulsivity during early childhood and conduct problems and antisocial behavior during middle childhood and adolescence (Brennan, Grekin, & Mednick, 1999; Fergusson, Woodward, &

Horwood, 1998; Wakschlag et al., 1997; Weissman, Warner, Wickramaratne, & Kandel, 1999). Even when potential mediators and confounds are considered (e.g., maternal age, drug use, psychopathology, SES, parent-child interactions), the findings suggest linear relationships between the number of cigarettes smoked per day and the increased predictive risk of child and adolescent conduct problems. As in the research on maternal age, the reasons why maternal smoking is related to child conduct problems are not clear. It could be that maternal smoking is a marker for some other set of risk factors (e.g., parental behavior, neighborhood effects [see respective sections on these topics]), or that prenatal exposure to nicotine affects fetal neurodevelopment, which in turn increases the child's vulnerability to conduct problems, or that these biological and social risk factors interact in some way. Indeed, controlled animal studies consistently show that exposure to low levels of nicotine alters fetal neural development (Navarro et al., 1989). Clearly, additional research is needed to help explain why prenatal maternal smoking is a predictive risk factor for later child conduct problems.

Two other classes of prenatal insults that have been related to later child conduct problems are exposure to alcohol and exposure to illegal drugs. Although research on prenatal exposure to alcohol has shown robust effects on cognitive development and neurodevelopment (e.g., attentional and intellectual deficits) during childhood and adolescence (Coles et al., 1991), research on conduct-related behaviors among these children suggests low to modest effects (Brown et al., 1991; Coles et al., 1991; Olson et al., 1997). Similarly, research on prenatal exposure to illegal drugs (e.g., cocaine) has found subtle and modest differences in intellectual behavior and arousal regulation between exposed children and nonexposed comparison children (Eyler, Behnke, Conlon, Woods, & Wobie, 1998; Lester, LaGasse, & Seifer, 1998). A recent study found prenatally exposed

boys to show more problems with undercontrolled behavior compared with nonexposed children from similar environmental backgrounds (Delaney-Black et al., 2000). Much of this work is ongoing and has so far followed children only through middle childhood; thus, the effects on adolescent behavior are not known.

A distinct yet equally challenging area of research concerns the study of genetic contributions to externalizing behavior problems. Generally, studies in this area can be subdivided into two categories: those examining the genetics of conduct disorders and those examining the genetics of behaviors that are relevant to the development of conduct problems. These behaviors are potentially important because they typically emerge earlier than conduct problems and may be developmental precursors.

In studying the genetic influences on conduct disorder, it has become clear that accurate description and subtyping of phenotypic behaviors are essential. Research has shown that levels of genetic and environmental influence appear to differ markedly for different patterns of conduct problems (Edelbrock, Rende, Plomin, & Thompson, 1995; Silberg et al., 1995). In the early starter pattern, adolescent boys with an earlier age of onset tend to be highly oppositional, to exhibit comorbid ADHD, and to engage in physical aggression, property crimes, and truancy. In the late starter pattern, boys with onset during adolescence typically do not have ADHD and restrict their problematic behavior to property crimes and truancy. Initial research examining concordance between twins suggests that early starter conduct disorder may be more strongly influenced by genetic factors than the developmental type of conduct problems that emerges during adolescence (Silberg et al., 1995).

A number of adoption studies, however, provide evidence for more complex relationships among genetic and environmental factors. The likelihood of

conduct problems in adopted-away offspring of antisocial parents (i.e., parents with criminal records) is significantly lower if they were raised by well-adjusted adoptive parents (Cadoret, Yates, Troughton, Woodworth, & Stewart, 1995). However, the ability to parent such children also may be affected in that genetically influenced characteristics of the child can evoke parenting behaviors that in turn increase the risk of developing externalizing behavior problems. Several studies of adopted offspring of antisocial parents have shown gene-environment evocative effects; adolescent externalizing behavior problems partially mediate the relationship between biological parent antisocial behavior and adoptive parent harsh/inconsistent discipline (Ge et al., 1996; O'Connor, Deater-Deckard, Fulker, Rutter, & Plomin, 1998). These results are supported by behavioral genetic studies of twins showing that the correlation between harsh parenting behavior and adolescent antisocial behavior problems is partially accounted for by variations in the adolescent's genetic background (Neiderhiser, Reiss, Hetherington, & Plomin, 1999). Thus, parenting and other environmental features appear to interact in complex ways with genetic dispositions in relation to youth conduct problems.

In addition to research on the genetic influences of conduct disorder, there has been research examining genetic influences on behaviors related to conduct disorder. Of the many childhood characteristics considered to be likely developmental precursors to serious conduct problems, two characteristics—ADHD and difficult-irritable-oppositional behavior—have been examined in a number of twin studies. Collectively, these studies indicate substantial genetic influence on attention problems and ADHD (Edelbrock et al., 1995; Gjone, Stevenson, & Sundet, 1996; Levy, Hay, McStephen, Wood, & Waldman, 1997; Sherman, McGue, & Iacono, 1997) and difficult-irritable-oppositional behavior (Cyphers, Phillips, Fulker, & Mrazek, 1990; Goldsmith, Buss, & Lemery, 1997), with heritability estimates generally

above .50. Unfortunately, most twin studies of difficult-irritable-oppositional behavior have confounded its measurement with aggressive behavior. Other child characteristics relevant to conduct disorder include lowered levels of empathy and lowered levels of harm avoidance/behavioral inhibition (Cyphers et al., 1990; Emde et al., 1992; Goldsmith et al., 1997). Twin studies consistently indicate low to moderate heritability of these behaviors, as well.

It is important to note, however, that behavioral genetic studies frequently are limited by their small, nonrepresentative samples and by methodological problems associated with restriction of range. A preponderance of the studies in Table 1 used Caucasian samples, with little attention to description or variations related to SES.

Implications for Malleable Child Risk Factors and Developmental Processes

The term *child factors* refers to characteristics of children that increase or decrease their risk for externalizing behavior problems. Such factors frequently have not been considered candidates for demonstrating "causal" relationships because they typically are conceptualized more as static traits or "unmalleable" predispositions. Our growing knowledge about development and the tremendous interplay among biology, environment, and behavior, however, challenges this thinking and suggests that many child factors may indeed be malleable, particularly during early development. An example of this social information processing, including hostile attributional bias. Interventions targeting these processes have shown that hostile attributions are malleable and that decreasing those attributes decreases child externalizing behaviors. Additional child factors reviewed here that similarly could serve as experimental targets

for preventive interventions are child empathy, moral reasoning, and social problem solving.

Even if child factors are not malleable, greater attention to these factors could be of great value to prevention research by improving the ability to focus interventions on children who are most at risk. A number of child factors reviewed here could be evaluated in terms of their usefulness as selection factors for high-risk studies, including individual differences in executive function, early academic difficulties, and early impulsivity and irritable emotionality, particularly when these characteristics co-occur with environmental risk factors.

In addition to highlighting targets for intervention, the current review indicates that additional research is needed to confirm the potential predictive risk of some child characteristics, particularly individual differences in autonomic activity, neuroendocrine factors, and neurochemical factors. Similarly, there is little to no existing information about the potential interactive effects among different child characteristics. For example, it is not known how individual differences in autonomic regulation relate to differences in cortisol regulation, emotional regulation, or both. Also, no one knows how interactions among such characteristics may vary across age groups or how family, peer, and other social environmental factors may affect these patterns. Research is needed to examine such interactions and investigate how the accumulation and interaction of child risk factors and environmental factors affects the developmental course and severity of conduct problems.

Future research on child characteristics related to conduct problems should consider two important issues. First, many potentially malleable child factors appear early in life, so researchers need to focus on an earlier part of the lifespan. Advancing such research may require collaborations between psychiatrists and developmental researchers with

an understanding of early childhood. Indeed, some findings (on maternal age and maternal smoking during pregnancy) suggest that research may need to focus on pregnancy and the behavior of young women that leads to early birth and child rearing; this research would require an even greater range of expertise and scientific disciplines. Second, it is vital that research testing experimental interventions targeting child factors include both males and females, as well as children from diverse ethnic backgrounds. The ratio of males with conduct problems to females with conduct problems is not as great as previously suspected. It is essential to determine whether risk factors for externalizing behavior problems in girls are the same as or distinct from those for boys and whether these factors are robust across ethnic groups.

Finally, it is important to note that there may be several opportunities for testing the potential causality of some child risk factors by partnering with intervention research on related outcomes. Current intervention trials that target maternal smoking, drug use, and alcohol use and that include long-term followup should be encouraged to examine child externalizing behavior problems. Similarly, intervention trials targeting early IQ, verbal abilities, and academic achievement should be encouraged to include assessment of externalizing behavior problems. This recommendation extends to psychiatric intervention trials focusing on the reduction of oppositional behavior and ADHD in early life. It is important to examine whether successful modification of these behaviors can reduce the incidence of conduct problems in later childhood and adolescence.

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Table 1: Child Characteristics—Research Summaries
Behavioral and Emotional Influences—Empathic, Sympathetic, and Prosocial Behaviors

Authors	Year	Design	Representativeness	Size	Age*	% Male	SES**	Ethnicity	Result	Key Statistics
Cohen & Strayer	1996	Concurrent group comparisons	Source specific: convenience: recruited conduct-disordered adolescents in residential treatment & local high school students without conduct problems	52	14-18 yrs	47%	Low-middle "majority of parents" 12 yrs old & employed in the trades	N/R	Conduct-disordered boys & girls scored lower than a comparison group of children without conduct disorder on affective & cognitive measures, including measures of empathic concern & perspective taking.	Empathy $F(1, 60) = 26.87, p < .0001$ $MS = 40.67$ conduct disorder, 64.20 comparison Empathy-Affective $F(1, 60) = 18.34, p < .0001$ $MS = 11.53$ conduct disorder, 30.75 comparison Empathic Concern $F(1, 60) = 8.14, p < .007$ $MS = 24.88$ conduct disorder, 28.31 comparison Perspective Taking $F(1, 60) = 11.08, p < .01$ $MS = 15.92$ conduct disorder, 24.39 comparison (ANOVA)
Ellenberg, Fabes, et al.	1996	Concurrent correlational	Convenience: recruited suburban grade school children, parents, & teachers	199	6-3rd gr $M = 9.0$ mos	51%	Middle $M = \$46.58$ (\$80-\$155k) Income/yr $M = 14.6$ yrs maternal ed $M = 15$ yrs paternal ed (9-20 yrs)	4% AFA 41% AFA 79% Cau 10% Hisp 5% Afr 2% NatA	Children with low levels of baseline distress & fewer gaze aversions during a distress film had higher mother, teacher, & teacher ratings of behavior & conduct problems, respectively.	Baseline Distress & Behavior Problems Partial $r(185) = -.19, p < .01$ mother Partial $r(127) = -.16, p < .05$ father Partial $r(185) = -.20, p < .0001$ teacher Gaze Aversions & Conduct Problems Partial $r(178) = -.15, p < .05$ mother Partial $r(127) = -.21, p < .03$ father Partial $r(185) = -.20, p < .007$ teacher (partial correlations)
Miller & Eisenberg	1998	Meta-analysis 23 studies 8 aggression, picture/story empathy empathy 9 aggression, questionnaire 8 externalizing, questionnaire	N/R	2,065 A/P = 378 A/Q = 803 EQ = 886	6 yrs- adult	>70%	N/R	N/R	Greater empathy was associated with lower levels of aggression & externalizing negative behaviors when assessed by questionnaire methods. For children school age 5 & older, empathy assessed by the picture/story method was also related to lower levels of aggression.	Questionnaire Empathy-Aggression $\chi^2(14, N = 15) = 23.72, p < .05$ $z = -.18, z = 4.90, p < .001$ $CI = (-.11) - (-0.25)$ Questionnaire Empathy-Externalizing $\chi^2(9, N = 10) = 10.37, p = ns$ $z = -.15, z = 4.28, p < .001$ $CI = (-.21) - (-0.08)$ Picture/Story Empathy-Ags (> 5 yrs old) $\chi^2(8, N = 9) = 7.26, p = ns, CI = (-.24) - (-0.03)$ $z = -.13, z = 2.52, p < .02$ (meta-analysis, chi-square, z scores)
Therrell, Pihl, et al.	1994	Prospective longitudinal 8 yrs	Population: boys in 53 public schools, low-SES areas, Montreal, Canada; rated by kindergarten teachers, eligible boys had Canadian-born, French-speaking parents with < 15 yrs of education	915	6 > 13 yrs	100%	Low $M = \$214$ U.S. income/yr $M = 10.5$ yrs maternal ed	100% Cau (French Canadian)	Low reward dependence (empathy/prosociality), high novelty seeking, & low harm avoidance/inhibition in kindergarten predicted delinquency at ages 11-13.	Delinquency Goodness of fit $\chi^2(310) = 894.62, p = .84$ Low reward dependence (empathy/prosociality) Wald's $\chi^2(1) = 4.8, p < .03$ High novelty seeking Wald's $\chi^2(1) = 25.1, p < .0001$ Low inhibition Wald's $\chi^2(1) = 5.9, p < .02$ (logistic regression analyses)

* > indicates that data at first age are used to predict data at second age.
** Unless otherwise indicated, income is reported in yearly amounts.

Child Characteristics—Behavioral and Emotional Influences Child Emotionality: Shy-Inhibited and Irritable-Difficult

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Bates, Pettit, et al.	1998	Prospective longitudinal 10 yrs	Convenience: recruited families with infants from birth records, Bloomington, IN (BLS), & families with 5 yr olds, Bloom- ington, IN, Knoxville & Nashville, TN, balanced for gender, low-high aggression (CDP)	90	6 mths > 10 yrs BLS; 5 > 10 yrs CDP	56% BLS; 99% CDP	Low-upper middle BLS M = 40.85 Hollingshead CDP 22% low 64% middle 15% up mid	15% AHA 84% Caut 1% Other CDP (BLS N/R)	Externalizing at 7-10 yrs of age (mother & teacher ratings) was predicted by the interaction of infant's resistance to control & mother's restrictive control. Resistance to control in infancy predicted externalizing for children with mothers low in restrictive control.
Caspi, H Moffe, et al.	1996	Prospective longitudinal 18 yrs	Population: consecutive births, Spring 1972-1973, Dunedin, New Zealand	961	3 > 21 yrs	56%	N/R	>93% Caut <7% Maut <7% Polyn	Undercontrolled children at age 3 were more likely than inhibited or well-adjusted children to be convicted of 2+ crimes or diagnosed with antisocial PD by age 21. Age 3 undercontrolled children & inhibited boys were more likely than well- adjusted children to be convicted of a violent offense by age 21.
Goldsmith	1996	Prospective longitudinal 2.5 yrs	Convenience: recruited from newspaper birth announcements	49 71 37 72	18 mths > 4 yrs	N/R	Working- middle	N/R% AHA N/R% AHA 85-95% Caut	Aggression at age 4 was associated with higher activity level, social barfiness, anger proneness, & less tendency to express pleasure at age 4. None of the temperament measures at age 18 mths predicted aggression at age 4.
Guerr, Gottfred, & Thomas	1997	Prospective longitudinal 10 yrs	Convenience: nonclinical sample of 1 yr olds & their families	104	1.5 > 12 yrs	55%	Middle M = 49.9 (28-66) Hollingshead M = 14.8 yrs maternal ed M = 15.3 yrs paternal ed	90% Caut 10% N/R	Difficulties at 1.5 yrs were associated with parent reports of problem behavior at 3.2 yrs, hostile-aggressive behavior at 3.5 yrs, externalizing at ages 4-6, 7-9, & 10-12, & teacher reports of externalizing at ages 6-8. rmm values were associated with being above the borderline clinical cutoff for hostile-aggressive behavior at 3.5 yrs, aggressive behavior at 4-12 yrs, & externalizing at 4-12 yrs.

Key Statistics
Resistance to Control & Externalizing
 $\chi^2(2, N = 239) = 0.705, p = ns$
Teacher report
 $\beta = .27$ low ctrl, $\beta = .05$ high ctrl BLS
 $\beta = .32$ low ctrl, $\beta = -.03$ high ctrl CDP
Mother report
 $\beta = .45$ low ctrl, $\beta = .10$ high ctrl BLS
 $\beta = .53$ low ctrl, $\beta = .22$ high ctrl CDP
BLS = Bloomington Longitudinal Study
CDP = Child Development Project
(Structural equation modeling)

Undercontrolled, Age 3 & Antisocial Personality
OR = 2.8, $p < .05$, 95% CI = 1.1-8.1
Undercontrolled, Age 3 & Recidivist Offender
OR = 2.2, $p < .05$, 95% CI = 1.1-4.7
Undercontrolled, Age 3 & Violent Offense
OR = 4.5, $p < .01$, 95% CI = 1.8-10.9
Inhibited Boys, Age 3, Violent Offense
OR = 3.7, $p < .05$, 95% CI = 0.09-7.9
(Multivariate logistic regressions)

Temperament Age 4, Aggression Age 4
 $r(49) = .38, p < .05$ activity level
 $r(49) = .24, p < .05$ social fearfulness (2nd mths)
 $r(49) = .56, p < .05$ anger proneness
 $r(49) = -.28, p < .05$ express pleasure
(p 's = ns: temperament 13 mths, aggression age 4)
(correlations)

Difficulties, 1.5 Yrs
 $r = .39, p < .001$ problem behavior 3.25 yrs
 $r = .34, p < .001$ hostile/aggressive 3.5 yrs
 $r = .57, p < .001$ externalizing 4-6, parent
 $r = .54, p < .001$ externalizing 7-9, parent
 $r = .43, p < .001$ externalizing 10-12, parent
 $r = .22, p < .05$ externalizing 6-8, teacher
Hostile Aggressive Behavior: Preschool
 $\chi^2 = 6.35, p < .05$, 12% not, 43% difficult 3.5 yrs
Aggressive Behavior
 $\chi^2 = 21.15, p < .001$, 4.6% not, 55% difficult 4-6 yrs
 $\chi^2 = 8.23, p < .01$, 3.4% not, 29% difficult 7-9 yrs
 $\chi^2 = 6.50, p < .05$, 4.6% not, 29% difficult 10-12 yrs
Externalizing
 $\chi^2 = 6.89, p < .05$, 25.3% not, 64% difficult 4-6 yrs
 $\chi^2 = 8.88, p < .01$, 12.6% not, 59% difficult 7-9 yrs
 $\chi^2 = 6.70, p < .01$, 11.5% not, 43% difficult 10-12 yrs
(nominations, chi-square)

Child Characteristics—Behavioral and Emotional Influences **Child Emotionality: Shy-inhibited and Irritable-difficult**

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Raine, Reynolds, et al.	1998	Prospective longitudinal 8 yrs	Population: unselected birth cohort, 1969; two towns in Mauritius (Island country in the Indian Ocean)	1,120	3 > 11 yrs	51%	N/R	< 5.6% Asian < 5.6% Cauc 26% Creole 69% Indian	High aggressive children at age 11 scored higher on stimulation seeking (or lower on harm avoidance/behavioral inhibition) at age 3 than children low in aggression in analyses with gender & ethnicity, SES, body size, & fearfulness controlled.

Tremblay et al., 1994: see "Empathic, Sympathetic, and Prosocial Behaviors"

Combined Regulation & Negative Emotionality

Eisenberg, Guthrie, et al.	2000	Prospective longitudinal 2 yrs	Convenience: recruited suburban grade-school children, -parents, & teachers	146	K-3rd > 2-5th gr	50%	Middle Mdn = \$10k (\$8k-\$15k) M = 14.9 yrs parental ed	1% AfA 1% AfA 82% Cauc 11% Hisp 3% Mex 2% NatA	In the best-fitting model, the path between attentional control (at control) & problem behavior at T1 & T2 was moderated by children's negative emotionality (NE); lower attentional control predicted problem behaviors for children high in NE. Behavioral regulation (but not) predicted T1 & T2 behavior problems for high or low NE children.
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Farrington & Hawkins	1991	Prospective longitudinal 10 yrs, 24 yrs	Population: sampled boys ages 8-9 yrs from 6 state primary & 1 special ed school in working-class area of London, 1961-1962; Cambridge Study in Delinquent Development	411	8-9 > 18-19 yrs, 32 yrs	100%	Low 23% < \$15 30% > \$20 income/yr	90% Cauc <10% W Ind <10% Crystid	High delinquency (age 8-10), high troublemaker status, a convicted parent, low school attainment, delinquent older siblings, & poor housing predicted convictions between ages 10 & 20, taking into account high nervousness, poor parent-child rearing, & low commitment to family.
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Henry, Caspi, et al.	1996	Prospective longitudinal 15 yrs	Population: consecutive births, Spring 1972-1973, Dunedin, New Zealand	475	3 > 18 yrs	100%	Low-upper 39% 1-3 39% 4 22% 5-6 (1 hr-6 low)	>93% Cauc <7% Maori <7% Polyn	Low regulation combined with negative emotionality & negativity (lack of control) at ages 3-5 predicted violent criminal status by age 18.
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Lengua, West, & Sandler	1998	Concurrent correlational	Convenience: 82% recruited from AZ court records of divorce petitions, mothers with child custody; 18% recruited through ads, self- & other referrals; metro area of Phoenix, AZ	232	9-12 yrs	50%	Low-middle M = \$27k	1% AfA 1% AfA 7% Hisp 89% Cauc 2% Other	Mother reports of impulsivity & attention focusing (regulation) & negative emotionality were related to mother & child reports of conduct problems. This study attempted to reduce item contamination by eliminating items determined to be overlapping according to confirmatory factor analysis & expert ratings.
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Key Statistics

Aggression Age 11, Stimulation Seeking Age 3
 $F(1, 394) = 6.1, p < .02, d = .25$
 $(p\% = ns; gender \times ethnicity \times aggression)$
 $F(1, 384) = 3.0, p < .05$ (control for SES)
 $F(1, 380) = 4.4, p < .04$
 (controls: height, weight, bulk, & fearfulness)
 (ANOVAS, ANCOVAs, Cohen's d)

Regression, NE, & Externalizing

$\chi^2(126, N = 146) = 160.7, p < .02, CFI = .959$
 $\beta = -.32, p < .01$ att control T1,2—behavior T1,2
 $\beta = -.22, p < .01$ att control T1,2—behavior T1,2
 $\beta = 1.21, p < .001$ att control T1—att control T2
 $\beta = 1.12, p < .001$ att control T1—beh reg T2
 $\beta = .35, p < .001$ att control T1—beh reg T1
 $\beta = .11, p = ns$ att control T2—beh reg T2
 (structural equation modeling)

Convicted Ages 10-20

multiple $R = .46$
 High troublemaker status, multiple $R = .29$
 $r(d) = .29, \Delta F = 34.33, p < .001$
 Convicted parent, multiple $R = .36$
 $r(d) = .29, \Delta F = 17.17, p < .001$
 High delinquency, multiple $R = .40$
 $r(d) = .29, \Delta F = 14.99, p < .001$
 $(p\% < .05)$ low school attainment, delinquent older siblings, poor housing, $p < .10$: high nervousness, poor parent-child rearing, low commitment to family)
 (forward stepwise multiple regression)

Regulation & Negative Emotionality

Violent vs. no conviction
 $OR = 1.52, r = .42, SE = .17, p < .05$
 Violent vs. nonviolent conviction
 $OR = 1.75, r = .56, SE = .19, p < .01$
 (logistic regression analyses)

Temperament & Conduct, Mother & Child Reports

$r\% = .13, p < .05, .44, p < .01$ (-) emotionality
 $r\% = -.13, p < .05, -.31, p < .01$ (+) emotionality
 $r\% = .18, p < .01, .46, p < .01$ impulsivity
 $r\% = -.13, p < .05, -.43, p < .01$ attention focusing
 (order of $r\%$: mother report, temperament & child report, conduct, mother reports of temperament & conduct)
 (zero-order correlations, items based on factor analysis)

Child Characteristics—Cognitive Influences

ADHD	Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
	Blodman, Parone, et al.	1996	Prospective longitudinal 4 yrs	Source specific/ convenience: clinic referred for ADHD & pediatric- referred normal controls	260	6-17 yrs > 10-21 yrs	100%	N/R lowest Hollingshead category excluded	100% Cauc	Children with ADHD & ODD at baseline were more likely to meet criteria for CD after wave 1 than children without ODD. Children with ADHD at baseline were no more likely to meet criteria for CD after wave 1 than children without ADHD.	Key Statistics ODD vs. Non-ODD $\chi^2 = 4.01, p < .05$ ADHD vs. Non-ADHD $\chi^2 = 2.35, p = ns$ (data analyzed by reviewer, percentages not reported) (chi-square)
	Mannuzza, Klein, et al.	1991	Prospective longitudinal replication 8-14 yrs M = 12 yrs	Source specific/ convenience: clinic referred for hyperactivity without diagnosis of delinquency or aggressivity; controls recruited at followup from medical center & phone calling; no behavior problems	172	M = 7.3 > 18.5 yrs	100%	Middle M = 3.0 Hollingshead	100% Cauc	Children diagnosed with ADHD* without a primary or secondary diagnosis of aggression or delinquency were more likely to meet criteria for conduct disorder or antisocial personality disorder during late adolescence/early adulthood than normal controls. *ODD not assessed.	Prevalence CD or Antisocial PD at Followup $\chi^2 = 15.11, p < .001$ 32% probands with ADHD, 8% controls (chi-square) Group: Followup CD or Antisocial PD, Control for SES Adjusted OR = 4.9, $p < .01$, 95% CI = 1.4-3.6 (logistic regressions)
	Moffitt	1990	Prospective longitudinal 15 yrs	Population: consecutive births, spring 1972-1973, Dunedin, New Zealand	435	3 > 15 yrs	100%	N/R	> 93% Cauc < 7% Maori < 7% Polyn	Children in the AOD + delinquency group at age 3 had higher levels of antisocial behavior at ages 5, 7, 9, 11 (but not at age 13) than children in the delinquency- only group. The delinquency-only & AOD + delinquency groups had higher levels of antisocial behavior than the AOD-only group & nondisordered controls.	Antisocial Behavior & AOD $F(12, 1202) = 14.92, p < .001$ group $\times$ age $F(3, 405) = 57.75, p < .001$ group (ANOVA, means not reported)
	Oosterlaan, Logan, & Sergeant	1998	Meta-analysis 8 studies, group comparisons	Source specific: clinic referred, 1990-1997	456	6-12 yrs	100% 5 studies, N/R for 3 studies	N/R	N/R	Deficits in response inhibition related to slow inhibitory process as determined by the Inhibition Function Slope and the Stop Signal Reaction Time were found for children with externalizing disorders (ADHD, conduct disorder, ADHD + conduct disorder) compared to normal controls.	Inhibition Function Slope ADHD vs. control (6 studies) $d = .94, Z = 6.36, p < .0001$ weighted $M's = 10.2$ ADHD, 14.8 control Conduct disorder vs. control (3 studies) $d = .56, Z = 2.35, p < .05$ weighted $M's = 12.6$ CD, 16.0 control Stop Signal Reaction Time ADHD vs. control (7 studies) $d = .64, Z = 4.97, p < .0001$ weighted $M's = 349.4$ ADHD, 246.4 control Conduct disorder vs. control (4 studies) $d = .51, Z = 2.64, p < .01$ weighted $M's = 265.7$ CD, 248.0 control (meta-analysis, Cohen's d)

Child Characteristics—Cognitive Influences

Executive Functioning and Inhibitory Control

Authors
Oosterlaan
& Sergeant

Year
1996

Design
Concurrent
group
comparisons

Representativeness
Source specific/
convenience:
recruited children
with externalizing
behaviors from
education services
& comparison group
from regular classrooms

Size
70

Age
6–12 yrs

% Male
N/R

SES
N/R

Ethnicity
N/R

Result
Children with externalizing
disorders, including aggression &
ADHD, were characterized by poor
inhibitory control as determined
by a more variable response
execution & deficient inhibitory
control.

Key Statistics
Response Execution Process, Latency (MKT)
 $F(3, 66) = 4.02, p = .011$
 $M's = 428$ ADHD, 398 agg, 385 anxious, 352 ctrl
Response Execution Process, Variability of Response
 $F(3, 66) = 5.92, p = .001$
 $M's = 116$ ADHD, 110 aggres, 95 anxious, 81 ctrl
(ANOVAs, post hoc Tukey)
Inhibitory Process, Stop Signal Reaction Time
 $t(33) = 3.77, p = .001$ aggressive vs. control
 $t(30) = 1.81, p < .04$ ADHD vs. control
 $M's = 256$ ADHD, 224 control, 273 aggressive
Inhibitory Process, Probability of Inhibition, Inhibitory Function Slope
 $t(30) = 1.86, p < .04$ ADHD vs. control
 $t(33) = 2.52, p < .009$ aggressive vs. control
 $M's = .163$ ADHD, .206 control, .145 aggressive
(ANOVAs, planned comparisons, one-tailed)

Authors
Séguin,
Boilence,
et al.

Year
1999

Design
Prospective
longitudinal
9 yrs

Population:
boys in 53 public
schools, low-SES
areas, Montreal, Canada;
rated by Kindergarten
teachers; eligible boys had
Canadian-born, French-
speaking parents with
< 15 yrs of education

Size
149

Age
6–15 yrs

100%
 $M = \$21k$ U.S.
 $M = 10.5$ yrs
maternal ed

Low
SES

100% Cau
(French
Canadian)

Conditional association learning
was lower for the unstable
aggressive group than for the
stable or nonaggressive group.
Subjective ordering abilities were
lower for the stable aggressive
group than the unstable or
nonaggressive groups. Analyses
controlled for ADHD status, IQ,
negative emotionality, & general
memory.

Executive Functioning, Posterior Dorsolateral Frontal
Conditional Association Tasks
Partial $F(2, 138) = 3.90, p < .05, r^2 = .05$
 $t(100) = -2.41, p < .02$ stable vs. unstable agg
 $t(90) = 2.34, p = .02$ unstable vs. nonagg
 $M's = .10$ stable, $-.27$ unstable, $.13$ nonagg
Executive Functioning, Mid-dorsolateral Frontal Lobe
Subjective Ordering
Partial $F(2, 138) = 4.19, p < .01, r^2 = .06$
 $t = -3.02, p < .003$ unstable agg vs. nonagg
 $M's = -.19$ stable, $-.01$ unstable, $.24$ nonagg
(MANCOVA, covariates: ADHD status, IQ, negative
emotionality, & general memory; ANOVAs, planned
comparisons, effect size—eta square)

Cognitive Ability

Authors
Fergusson
& Horwood

Year
1995

Design
Prospective
longitudinal
7 yrs

Population:
birth cohort, mid-
1977, Christchurch,
New Zealand, urban,
high attention

Size
709

Age
8–15 yrs

N/R

Low-upper
SES

85% Cau
15% Polyn
(yr 5)

IQ and disruptive behavior
(conduct problems & attention
deficit) at age 8 mediated the
relationship between scholastic
ability at age 13 & delinquency
at age 15.

Scholastic Ability Age 13, Delinquency Age 15
Log likelihood $\chi^2(34) = 27.6, p > .50, GFI = .99$
 $\beta = .68, p < .0001$ conduct & delinquency 15
 $\beta = .005, p = ns$ school ability—delinquency
 $\beta = .78, p < .0001$ conduct—attention deficit
 $\beta = -.27, p < .0001$ attention deficit—school ability
 $\beta = -.38, p < .0001$ IQ—school ability
 $\beta = -.41, p < .0001$ IQ—attention deficit
 $\beta = -.38, p < .0001$ IQ—conduct problems
(structural equation model)

Child Characteristics—Cognitive Influences

Cognitive Ability		Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Stattin & Klackenborg-Larsson	1993		Prospective longitudinal 30 yrs	Convenience	recruited every 4th mother, international clinic, Stockholm, Sweden, 1955-1958; pilot group included	122	3 mths > 30 yrs	100%	N/R	100% Cauc	Early language ability (18 & 24 mths, age 3, & age 5) & IQ at age 3 (but not 5, 8, 11, 14, or 17) was negatively associated with criminality by age 30, controlling for SES. Nonoffenders had higher average IQ scores from ages 3 to 17 than did frequent offenders.
Whitla, Moffitt, & Silva	1989	Prospective longitudinal 10 yrs		consecutive births, Spring 1972-1973, Dunedin, New Zealand	804	5 > 15 yrs	51%	N/R		> 93% Cauc < 7% Maori < 7% Polyn	Delinquency at ages 13-15 was associated with lower average IQ at ages 7, 9, 11, & 13 for high- & low-risk boys and girls.
Fergusson & Horwood	1998	Prospective longitudinal 10 yrs		1977 birth cohort, Christchurch, New Zealand, urban, high attrition	969	8 > 18 yrs	N/R	Low-upper	85% Cauc 15% Polyn (yr 5)		Conduct problems at age 8 were associated with increased risk of leaving school without qualifications, controlling for IQ & attention problems (8 yrs), maternal age, parental conflict, & living standards (0-8 yrs). Adolescent behavior patterns ages 16-18, delinquent peer affiliations, cannabis use, & school suspensions mediated the relationship between conduct problems in middle childhood & leaving school without qualifications, controlling for the above-mentioned variables.
Frids, Kempthaus, et al.	1991	Concurrent group comparisons		Source specific: children referred to 3 university-based clinics for disruptive behavior problems	177	7-12 yrs	100%	Low-upper at least 12% in each of 5 Hollingshead levels	70% Cauc 30% N/R		Academic underachievement was associated with ADHD & conduct disorder (CD) diagnoses. When the co-occurrence of ADHD & CD was taken into account, academic underachievement was associated with ADHD and not CD.

Key Statistics

Early Language Ability, IQ, & Criminality by Age 30
Partial $r = -.16$ language ability, 18-24 mths
Partial $r = -.15$ language comprehension, 3 yrs
Partial $r = -.18$ language comprehension, 5 yrs
Partial $r = -.15$ language maturity, 5 yrs
Partial $r = -.16$ IQ, age 3
(p 's < .05; p 's = ns: IQ at ages 5, 8, 11, 14, 17)
Offender Status & Average IQ, Ages 3-17
 $F(2, 109) = 4.08$, $p < .05$, $p < .01$ contrast
 M 's = 101.7 nonoffender, 91.4 frequent
(partial correlations, SES controlled, ANOVA contrasts)
Total IQ Scores, Risk, & Delinquent Status
 $F(2, 407) = 4.82$, $p < .01$ boys
 M 's = 98.6^a high-risk, 102.9^a low-risk delinquent
 M 's = 105.1^b high-risk, 109.1^b low-risk nondelinquent
 $F(2, 387) = 3.31$, $p < .05$ girls
 M 's = 97.8^a high-risk, 101.2^a low-risk delinquent
 M 's = 105.2^b high-risk, 107.0^b low-risk nondelinquent
(p 's = ns: risk status, risk x delinquency interaction)
(MANOVA, means with different letters differ $p < .05$)
% Leaving School by Extent Conduct Problems
OR = 1.8, $p < .05$ (95% CI = 1.1-2.6)
17.0% low (1-50th), 19.9% low-mid (51-75th)
23.2% mid (76-90th), 26.8% mid-high (91-95th)
30.7% high (96-100th percentile)
% Leaving School by Extent Conduct
 $p > .90$ adjusted for adolescent behavior
 $p < .0001$ delinquent peer affiliations
 $p < .05$ cannabis use
 $p < .05$ suspension from school
19.5%-19% low, low-mid, mid, mid-high, high
(covariates: attention problem, age 8 WISC-R, maternal age, living standards, & parent conflict) (logistic regression models)
% of Children Underachieving, by Diagnosis
23% ADHD ($n = 111$), 22% CD ($n = 68$)
22% ADD + HY ($n = 97$), 7% clinic control ($n = 42$)
(p 's < .05, group vs. clinic control)
% of Children Underachieving, Control ADHD, CD
Effect = .01, ADHD regression model
18% ADHD ($n = 62$), 5% CD ($n = 19$),
29% ADHD + CD ($n = 29$), 6% clinic control ($n = 47$)
(chi-square, 2 x 2 logit model analyses)

Child Characteristics—Cognitive Influences

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Maguin & Loeber	1996	Meta-analysis 68 studies 42 cross-sectional 26 longitudinal	Convenience/ population: selected studies with representative samples (national, school, city)	28,552 cross 19,265 longit n = 50- 4,637	Under 18	74% samples	N/R	N/R% Afr N/R% Cau	Lower academic performance was related to delinquency (seriousness, frequency, prevalence), even after controlling for SES. The relationship was stronger for males. Children with low academic performance were twice as likely to be delinquent.	Academic Performance & Delinquency ES = -.149, OR = 2.07 cross-sectional, bivariate z = 3.2, p < .005 ES = -.15 males, -.09 females ES = -.139 cross-sectional, control SES ES = -.127 OR = 1.87 longitudinal, bivariate ES = -.128 longitudinal, control SES (meta-analysis, effect size, weighted for sample size)
Social Information Processing										
Crick	1995	Concurrent group comparisons	Convenience: recruited from grade school in midsize Midwest city	239	3rd-6th gr	55%	N/R	26.6% Afr 73.0% Cau 0.4% Other	Relationally & relationally + overtly aggressive children held more hostile attributions for relational & instrumental conflict respectively than nonaggressive children.	Intent Attributions & Relational Conflict F (2, 227) = 5.9, p < .01; M's = 7.2 app, 5.6 non Intent Attributions & Instrumental Conflict F (2, 227) = 4.4, p < .01, M's = 6.6 app, 5.2 non (group x grade x sex ANOVAs; Duncan tests p < .05)
Dodge, Baies, & Pettit	1990	Prospective longitudinal 6 mths	Convenience: parents recruited during preregistration for kindergarten, Nashville, Knoxville, TN, & Bloomington, IN	309	5 > 5.5 yrs	53%	Middle Adm = 38.5 (14-46) Hullingshead	16% Afr 83% Cau 1% Other	Social information processing variables predicted peer, teacher, & observer ratings of aggression 6 mths later. Significant variables included encoding of relevant cues, aggressive responses, low competent responses, hostile attributional bias, low solution generation, & evaluations of aggression as leading to positive outcomes.	Social Information Processing & Aggression Teacher ratings R = .24, F (7, 294) = 2.51, p < .02 r = .16, p < .006 encoding relevant cues r = .16, p < .001 access aggressive responses r = -.17, p < .001 no access competent responses Peer ratings R = .25, F (7, 294) = 2.70, p < .01 r = .13, p < .03 encoding relevant cues r = .19, p < .001 access aggressive responses Observer ratings R = .20, F (7, 294) = 3.86, p < .001 r = .14, p < .02 hostile attributional bias r = -.21, p < .001 solutions to social problems r = .16, p < .005 pos eval outcome of aggression (multiple regressions)
Dodge, Pettit, et al.	1995	Prospective longitudinal 4 yrs	Convenience: parents recruited during preregistration for kindergarten, Nashville, Knoxville, TN, & Bloomington, IN	520	K > 4th gr	52%	N/R	16% Afr 82% Cau 2% Other	Social information processing (SIP) scores at age 4 accounted for a significant proportion of variance in gr 4 teacher ratings of externalizing. The gr 4 conduct problem group demonstrated greater social information processing problems in the previous 4 yrs than did the nonproblem group. Children with 3 or 4 processing problems were 4 times more likely to develop clinically relevant conduct problems than children without processing problems.	SIP & Externalizing Gr 4 R ² = .11, p < .001 β = .23, p < .001 encoding errors β = .15, p < .05 hostile attributions β = .23, p < .001 access aggressive responses SIP & Conduct Problems F (4, 430) = 4.66, p < .001 Encoding errors F (1, 433) = 12.39, p < .001 M's = .55 conduct problem, .05 no problem Hostile attribution F (1, 434) = 4.44, p < .04 M's = .37 conduct problem, .06 no problem Access agg resp F (1, 433) = 4.47, p < .04 M's = .32 conduct problem, .04 no problem (Multiple regression, MANOVA, univariate ANOVAs) # of SIP Problems & Risk of Conduct Problems χ ² (3, N = 442) = 11.76, p < .01 3-4 vs. no problems χ ² (1, N = 442) = 3.85, p < .05 any vs. no problems 6% no SIP problems, 13% 1 SIP problem 16% 2 SIP problems, 27% 3 or 4 SIP problems (structural equation model)

Child Characteristics—Cognitive Influences Social Information Processing

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Grobbs, Hudley, & Graham	1993	Intervention random assignment 1) attribution 2) attention training 3) no control	Convenience: recruited students rated by teachers & peers as aggressive, 17 classrooms in 2 elementary schools, Los Angeles, CA, area	66	40–60 yr <i>M</i> = 10.5 yrs	100%	Low	100% Afr	Aggressive boys showed improved social information processing & were rated by teachers as less aggressive following an attributional intervention. Specifically, aggressive boys in the attributional treatment group showed reductions in attributions of hostile intent in response to ambiguous, hypothetical peer provocation (questionnaire measure), compared to boys in the attention training or control groups. Observations in a lab setting found that boys in the attributional treatment group were less likely to infer intentionality in peer provocation than boys in the other 2 groups.	Aggression, Teacher Ratings <i>F</i> (2, 63) = 3.46, <i>p</i> < .05 <i>t</i> (19) = 2.63, <i>p</i> < .05 attributional treatment group <i>M</i> 's = 27.55 pre, 24.05 post (<i>p</i> 's = ns: attention training, control groups) (<i>p</i> 's = ns: repeated measures ANOVA) (group × time repeated measures ANOVA) Intentionality, Ambiguous Hypo Peer Provocation <i>F</i> (6, 122) = 10.2, <i>p</i> < .01 <i>t</i> (19) = 8.08, <i>p</i> < .001 attributional treatment grp <i>M</i> 's = 5.31 pre, 2.63 post (<i>p</i> 's = ns: attention training, control groups) (group × time × condition repeated measures ANOVA) Intention Ratings, Analog Task, Peer Provocation <i>F</i> (2, 64) = 9.85, <i>p</i> < .001 <i>M</i> 's = 2.25 ^a vs. 4.45 ^b training, 4.72 ^b control (ANOVA, <i>M</i> 's with different letters differ <i>p</i> < .05)
Groop, Grobbs, & Basinger	1994	Concurrent group comparisons	Source specific/ convenience: recruited incarcerated youth & nondelinquent suburban public high school students	323	13–19 yrs	54%	Low ^a Middle ^b Nondelinquent ^c	26% Afr 73% Cau 1% Other model = 98% Cau, nondelinquents, controlling for del = 48% Cau, age, SES, & verbal intelligence. 51% Afr, 2% Other	Delinquent female & male adolescents had lower moral reasoning scores than nondelinquents, controlling for age, SES, & verbal intelligence.	Moral Judgment Maturity <i>F</i> (6, 317) = 38.46, <i>p</i> < .0001 <i>M</i> 's = 243.1 male, 253.7 female delinquents <i>M</i> 's = 272.5 male, 288.7 female nondelinquents (main effects significant, <i>F</i> values not reported) (group × sex ANCOVA, covariates: age, SES, verbal IQ)
Nelson, Smith, & Dodd	1990	Meta-analysis 15 studies 3 unpublished 4 dissertations	Not reported: 11 studies did not control comparison group delinquency	673 <i>n</i> 's = 8 to 60	11–17 yrs <i>M</i> = 15.34	N/R	N/R	N/R	Across 15 studies, delinquents had lower levels of moral reasoning than nondelinquents.	Moral Reasoning & Delinquent vs. Nondelinquent <i>Q</i> (14) = 19.52, <i>p</i> < .05 <i>d</i> = .74, 95% CI = .62–.93; <i>d</i> 's 24–1.68 (meta-analysis, effect size <i>d</i> , corrected for small <i>N</i> to <i>d</i>)
Rubin, Bream, & Rose-Krahn	1991	Concurrent group comparisons	Convenience: recruited from elementary school, Southern Ontario	54	3rd–4th gr <i>M</i> = 9.36 yrs	50%	N/R	N/R	Peer-nominated aggressive children had more aggressive social goals (gain attention & stop or redirect peers' behavior) to resolve hypothetical social dilemmas & more aggressive social strategies (including hitting & grabbing) to resolve naturalistic social dilemmas compared to non-aggressive children.	Aggression & Social Goals <i>R</i> ² = .39, <i>F</i> (8, 31) = 2.46, <i>p</i> < .05 Partial <i>r</i> 's = .33 attention, .40 stop action, <i>p</i> 's < .01 Aggression & Social Strategies <i>R</i> ² = .54, <i>F</i> (11, 28) = 3.00, <i>p</i> < .05 Partial <i>r</i> = .45, <i>p</i> < .01 agonistic acts Partial <i>r</i> = .45, <i>p</i> < .01 callings Partial <i>r</i> = .33, <i>p</i> < .02 statements Partial <i>r</i> = .28, <i>p</i> < .05 orienting acts (multiple regressions, partial <i>r</i> 's control age & gender)
Rubin, Miller, & Empage	1987	Concurrent correlational	Convenience: recruited from 4 1st-gr classes in Southwestern Ontario	72	<i>M</i> = 80 mths	47%	Lower- upper middle	N/R	1st-gr children rated by teachers as hostile/aggressive had less flexible or relevant solutions to a friendship initiation test (offered fewer invitations & showed more abnormal strategies). These children had fewer prosocial & more aggressive solutions to a dilemma requiring object acquisition from peers.	Hostile-Aggressive, Teacher Ratings & Friendship Test <i>r</i> 's = -.20 relevant categories, -.21 flexible <i>r</i> 's = -.21 invitations, .21 abnormal/izarre (<i>p</i> 's < .05) Hostile-Aggressive, Teacher Ratings & Object Test <i>r</i> = -.36 prosocial, .43 manipulate affect, <i>p</i> 's < .001 <i>r</i> = -.27, <i>p</i> < .01 bronze (correlations)

Child Characteristics—Cognitive Influences

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Delinquent & psychopathic indicators	Key Statistics
Trevethan & Walker	1988	Concurrent group comparisons	Source specific convenience: recruited incarcerated youth from facility & matched (age, race, occupation) nonincarcerated high school students	44	15–18 yrs	100%	N/R	100% Cauc	Delinquent & psychopathic incarcerated youth exhibited lower levels of moral reasoning when presented with hypothetical & real-life dilemmas compared to a nonincarcerated comparison group.	Moral Reasoning, Delinquents, Psychopaths, Controls $F(2, 41) = 5.60, p < .01$ group $\times$ dilemma interaction $M = 257.5^a$ normal controls $M = 230.2^b$ delinquents, 224.4^b psychopaths ($p < .05$ dilemma type, $p = ns$ interaction) (group $\times$ dilemma type ANOVA, Tukey comparison, M 's with different letters differ $p < .05$)

Biological Influences—Autonomic Influences

Mezzacappa, Tremblay, et al.	1997	Concurrent correlational	Source specific: recruited from larger study (see earlier Tremblay entry); subsample included boys with early onset stable aggression & without aggression	153	10–15 yrs	100%	Low; lower 2 of 6 Canadian SES categories	100% Cauc	Increasing levels of antisocial behavior were associated with lower heart rate (HR), respiratory-driven cardiac-altered vagal control (HF HRV), & sympatho-vagal (LF/HF) balance, not accounted for by differences in respiratory drive.	Antisocial Behavior, Self Report & HR Standing HR PE = -3.95, partial $F(2, 121) = 7.33, p < .008$ Supine HF HRV PE = -4.06, partial $F(1, 118) = 9.84, p < .002$ Supine LF/HF PE = -1.4 (.06), partial $F(2, 111) = 6.20, p < .02$ (stepwise regression)
Raine, Venables, & Mednick	1997	Prospective longitudinal 8 yrs	Population: unselected birth cohort, 1969; two towns in Mauritius (Island country in the Indian Ocean)	1,130	3 yrs	51%	N/R	<5.6% Asian <5.6% Cauc 26% Creole 69% Indian	Children in the low resting heart rate (HR) group at age 3 were twice as likely to be in the high aggression group at age 11. Low HR children had higher aggression scores, more nonaggressive behavior, & more total antisocial behavior at age 11 than children in the high HR group. Children in the high aggressive group had lower HRs than children in the low aggressive group. This effect remained across separate analyses controlling for biological (body size, motor activity), psychological (family discord, temperament, SES deprivation) & comorbidity (hyperactivity) confounds.	Aggression Group & Low Resting HR $Z = 12.1, df = 1, p < .0005, d = .64, 2.08$ risk 65.5% low HR 34.5% high HR aggression (2×2 chi-square) HR Age 3, Aggression & Antisociality Age 11 $F(1, 360) = 9.2, p < .003, d = .32$ aggression $F(1, 360) = 4.1, p < .04$ nonaggressive antisocial $F(1, 360) = 7.7, p < .006$ total antisociality HR Age 3, Aggression Age 11, & Covariates $F(1, 380) = 7.5, p < .006$ (control body size) $F(1, 383) = 7.8, p < .006$ (control motor activity) $F(1, 378) = 9.9, p < .002$ (control family discord) $F(1, 392) = 4.3, p < .04$ (control temperament) $F(1, 274) = 9.4, p < .002$ (control SES deprivation) $F(1, 392) = 7.8, p < .005$ (control hyperactivity) (ANOVAs & ANCOVAs, M 's not reported)
Raine, Venables, & Williams	1995	Prospective longitudinal 14 yrs matched group comparisons	Convenience: recruited from schools in north England city, (1) working-class, poor academic; (2) residential & rural, good academic; (3) mixed, unselected	51	15 > 20 yrs	100%	Low-middle	N/R (North England)	Higher resting heart rate (HR), resting electrodermal (EDA), & orienting EDA at age 15 predicted absence of criminality at age 29. Desistors had higher resting HRs, resting EDAs, and orienting EDAs than criminals. desistors: ASB age 15 – no adult crime, normals: no ASB age 15 or adult crime, criminals: ASB age 15 & adult crime	Autonomic Arousal, Age 15 & Criminality, Age 29 Resting HR $F(2, 48) = 3.6, p < .04$ $t(32) = 2.9, p < .007$ desistors vs. criminals *approx. M 's = 80 desistors, 74.5 norm, 71.7 criminal Resting EDA $F(2, 44) = 5.2, p < .009$ $t(29) = 2.8, p < .007$ desistors vs. criminals M 's = 7.5 desistors, 6.3 criminals Orienting EDA $F(2, 44) = 3.4, p < .04$ $t(28) = 2.7, p < .01$ desistors vs. criminals M 's = 4.0 desistors, 1.8 criminals (MANOVAs, ANOVAs, planned comparisons, 2-tailed t tests)

Child Characteristics—Biological Influences

Neuroendocrine Influences—Adrenal Hormones

Authors Moir, Vanyukov, & Herten
Year 1997
Design Concurrent group comparisons
Representativeness Source specific: all clinic referred for problems with aggression

Size 42
Age School age
% Male 100%
SES N/R
Ethnicity N/R
Result Lower basal cortisol was associated with more symptoms of aggressive conduct disorder & more aggressive behavior with peers. Analyses took into account parent psychopathology, parent-child relationships, & SES.

Source specific: sons of fathers w/ & without h/o of psychoactive substance abuse recruited through ads, tx, & community centers

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Source specific: sons of fathers w/ & without h/o of psychoactive substance abuse recruited through ads, tx, & community centers

Authors Susman, Dorn, et al.
Year 1997
Design Prospective longitudinal 1 yr
Representativeness Convenience: sample recruited from suburban Washington, DC

Size 36
Age 9–15 yrs
% Male 58%
SES Middle-upper middle
Ethnicity N/R
Result Increased cortisol reactivity was associated with more nonaggressive behavior problems and overall conduct behavior problems 1 yr later.

Source specific: sample recruited from suburban Washington, DC

Source specific: sample recruited from suburban Washington, DC

Source specific: sample recruited from suburban Washington, DC

Sex Steroids

Authors Fritschstein, Susman, et al.
Year 1997
Design Experiment randomized double-blind, placebo-controlled crossover design

Size 49
Age 10–19 yrs
% Male 76%
SES N/R
Ethnicity N/R
Result Physical aggression & aggressive impulses increased following low & mid-level doses of estrogen for girls & mid-level doses of testosterone for boys.

Source specific: recruited youth referred for subacute delay to outpatient clinic

Source specific: recruited youth referred for subacute delay to outpatient clinic

Source specific: recruited youth referred for subacute delay to outpatient clinic

Source specific: recruited youth referred for subacute delay to outpatient clinic

Authors Olweus, Hertzman, et al.
Year 1988
Design Prospective longitudinal 3 yrs
Representativeness Population: representative sample of male public school 9th graders, suburban Stockholm, Sweden

Size 58
Age 15–17 yrs
% Male 100%
SES N/R
Ethnicity 100% Caucasian (Swedish)
Result High levels of plasma testosterone were associated with low frustration tolerance (more impulsivity & irritability) & more provoked aggressive behavior (self-report). Low frustration tolerance mediated the effect of plasma testosterone on unprovoked aggressive behavior. The model included mother's negativity & permissiveness for aggression, parent's power assertion, & retrospective report of boys' temperament.

Source specific: representative sample of male public school 9th graders, suburban Stockholm, Sweden

Source specific: representative sample of male public school 9th graders, suburban Stockholm, Sweden

Source specific: representative sample of male public school 9th graders, suburban Stockholm, Sweden

Key Statistics

Aggressive CD Symptoms & Cortisol
 $R^2 = .466$, $F(4, 37) = 12.45$, $p < .001$
 $\beta = -.37$, partial $R^2 = .13$, $F(1, 37) = 12.8$, $p < .001$
(p 's < .001: per psychopathology, parent-child rel, SES)
Peer-Nominated Aggression & Cortisol
 $R^2 = .236$, $F(4, 37) = 4.24$, $p < .01$
 $\beta = -.47$, partial $R^2 = .20$, $F(1, 37) = 14.5$, $p < .001$
(p 's = ns: per psychopathology, parent-child rel, SES) (multiple regressions)

Risk Group, Time, & Salivary Cortisol
 $F(1, 187) = 4.56$, $p < .05$ Group $\times$ Time
(p = ns when age delinquency & impulsivity controlled)
 $\beta = -.14$ aggressive delinquency
 $\beta = -.16$ impulsivity
(repeated measures ANCOVA, covariate SES)

Cortisol Reactivity & Nonaggressive Behavior Problems
 $F(2, 60) = 4.61$, $p = .01$
Cortisol Reactivity & Conduct Behavior Problems
 $F(2, 60) = 5.06$, $p = .01$
(ANCOVA, covariate age, M 's not reported)

Girls, Low-Level Dose Estrogen & Aggression
48% ($p = .003$) $\wedge$ (increased) aggressive impulse
28% ($p = .02$) $\wedge$ physical aggression to peers
31% ($p = .01$) $\wedge$ aggression toward adults
28% ($p = .02$) $\wedge$ aggression toward peers
40% ($p = .01$) $\wedge$ aggressive impulse
Boys, Mid-Level Dose Testosterone & Aggression
18% ($p = .03$) $\wedge$ aggression toward adults
17% ($p = .02$) $\wedge$ aggression toward peers
19% ($p = .06$) $\wedge$ aggressive impulse
(ANOVA, tx, sequence, sex, visit, sex $\times$ tx, Sign test)

Circulating Testosterone & Aggression, Self-Report
Provoked aggression $R^2 = .476$, $p < .01$
 $\beta = .34$ testosterone—provoked aggressive beh
 $\beta = .27$ testosterone—impulsivity & irritability
(p = ns: impulsivity & irritability—provoked agg beh)
Unprovoked aggression $R^2 = .499$, $p < .05$
 $\beta = .27$ testosterone—impulsivity & irritability
 $\beta = .34$ impulsivity & irritability—unprovoked agg
(p = ns: testosterone—unprovoked agg behavior) (path analysis)

Child Characteristics—Biological Influences Neurochemical Influences—Serotonin

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Holperin, Newcom, et al.	1997	Concurrent longitudinal group comparisons replication	Source specific: all met criteria for ADHD based on parent & teacher ratings	50	7–11 yrs	100%	N/R	N/R	Young aggressive boys had greater prolactin response to FEN challenge than young nonaggressive boys. There were no differences in prolactin response for aggressive or nonaggressive older children over 9.1 yrs old.	Proctin Response to FEN Challenge (S-HT function) $F(2, 47) = 5.24, p < .05$ (age $\times$ group) $M = 14.97$ ng/ml young, aggressive $M = 9.32$ ng/ml young, nonaggressive ($p =$ ns, children over 9.1 yrs old) (controlling for plasma medication level) (ANCOVA)
Kruesi, Hibbs, et al.	1992	Prospective longitudinal $M = 26$ mths	Source specific: all diagnosed with disruptive behavior disorder	29	6–17 yrs $M = 11.3$ yrs T1	93%	N/R	17% AfA 76% CauC 7% Other	Lower 5-HIAA at initial assessment predicted severity of physical aggression at followup for children with disruptive behavior disorders.	Physical Aggression & 5-HIAA Concentration Partial $r = -.53, p = .006$ (partial correlation, controlling for age)
Pine, Coplan, et al.	1997	Prospective longitudinal 14–24 mths	Source specific: all younger siblings of delinquents, NY, NY	34	3–13 yrs	100%	Low	44% AfA 56% Hisp	Higher aggression and lower encouragement of maturity was associated with greater prolactin (PRL) response to FEN challenge.	PRL Response to FEN Challenge, Aggression, & Adverse Rearing (Encouragement of Maturity) $R^2 = .60, F(4, 29) = 10.5, p < .001$ $\beta = .32, t = 2.9, df = 28, p < .01$ aggression $\beta = -.44, t = 3.6, df = 28, p = .001$ encour. maturity (controlling for baseline prolactin) (multiple regression)
Dopamine										
Gavin, Stiwell, & Shelver	1997	Concurrent group comparisons	Source specific: all psychiatric inpatients, majority disruptive disorders	17	$M = 12.5$ yrs	100%	Low-upper 14% 1–2 27% 3 59% 4–5 Hollingshead 1 hi–5 low	N/R	Poorer conscience functioning (interference with peer- & authority-derived valuation) was associated with lower serum dopamine beta-hydroxylase (DβH).	DβH Levels and Conscience Functioning* $t(15) = 2.08, p < .03$ (one-tailed) $M(SD) = 25.18(18.9)$ better conscience fund. $M(SD) = 12.74(5.92)$ poorer conscience fund. (*interference with authority/peer valuation) (t test)
Kupersman, Kramer, & Loney	1988	Concurrent correlational	Source specific: referred during childhood to outpatient clinic for overactivity	31	21–23 yrs	100%	Low-upper 14% 1–2 27% 3 59% 4–5 Hollingshead 1 hi–5 low	100% CauC	Plasma dopamine beta-hydroxylase (DβH) was positively associated with disinhibition & sensation seeking.	Sensation Seeking & Plasma DβH Activity $r = .38, p < .05$ disinhibition $r = .37, p < .05$ sensation seeking, total score (Pearson correlation)
Limon, Goldman, et al.	1991	Concurrent correlational	Source specific: chronic alcoholic inpatients, inpatient nonalcoholic controls	65	$M = 44$ yrs	100%	N/R	N/R	Greater lifetime history of impulsivity-aggressivity was associated with lower concentrations of CSF dopamine metabolite HVA.	Lifetime Aggression & CSF Concentrations of HVA $r(65) = -.37, p < .01$ total group $r(50) = -.40, p < .01$ alcoholics (during sobriety) (Pearson correlation, Bonferroni correction)

Child Characteristics—Biological Influences

Maternal Age	Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
	Christ, Lahay, et al.	1990	Concurrent correlational	Source specific: children referred to 3 outpatient psych-clinic/psychiatry with 1+ biological parent, had no mental retardation, psychosis	253	6-13 yrs	100%	Low-high 25.6% unskilled 33% semiskilled 27% skilled 11% minor prof 4% professional	12.5% AfA 87.5% Cau	Teenage motherhood (< 20 or < 18 yrs old, first child or referred child) well correlated with total number of child conduct problems. Comparison of models that included SES & maternal & paternal antisocial personality found that the data were best fit by a model indicating a spurious relationship between teenage motherhood & child conduct problems, rather than a mediational or independent effects model.	Teenage Motherhood & Conduct Problems $r = .33, p < .01$ 1st child $r = .23, p < .01$ proband child Best Fit Model $\beta = .11, p = ns$ teen mother 1st child—conduct $\beta = .17, p < .05$ maternal antisocial—conduct $\beta = .16, p < .01$ paternal antisocial—conduct $\beta = .33, p < .0001$ SES—conduct $\beta = .15, p < .01$ maternal antisocial—teen mother $\beta = .20, p < .001$ paternal antisocial—teen mother $\beta = .35, p < .0001$ SES—teen mother (β 's for analyses with proband, not 1st child and/or under 18 yrs old not provided, results similar) (zero-order correlations, path analysis)
	Ferguson & Lynskey	1993	Prospective longitudinal 13 yrs	Population: from birth cohort, 1977, Christchurch, New Zealand, urban; 81% of original cohort	953-1,048	Birth > 8, 10, 12 yrs	N/R	Low-upper	85% Cau 15% Polyn (yr 5)	Higher maternal age (< 20, 20-24, 25-29, 30+ yrs old) was related to fewer childhood & early adolescent (ages 8, 10, & 12) behavior problems (teacher reports). This relationship held for age 12 behavior problems (but not age 8 or 10), controlling for measures of maternal background & childhood life history, including maternal ed, SES, family size, avoidance of punishment, & parental discord.	Maternal Age & Conduct Disorder $r = -.19, p < .0001$ age 8 ($n = 1,048$) $r = -.19, p < .0001$ age 10 ($n = 1,022$) $r = -.18, p < .001$ age 12 ($n = 972$) Maternal Age, Conduct Disorder, Maternal Background, & Childhood Life History $\beta = -.13, p < .001$ ($n = 953$) M 's = 54.5 (< 20), 53.3 (20-24), 52.0 (25-29) 50.2 (30+ yrs) (β 's < .05: maternal education, SES, family size, avoidance of punishment, parental discord) (ρ 's = ns: parent changes (mother & child), planned pregnancy, unhappy childhood, breastfeeding, maternal emotional responsiveness, family income, preschool education, school changes, life events) (multiple linear regression model)
	Spieker, Larson, et al.	1997	Concurrent descriptive	Convenience: recruited pregnant adolescents < 17 yrs from prenatal clinics, public schools, & nonprofit agencies in metro area of Northwest city	152	6 yrs	60.5%	Low-middle 47% public assistance; 28% < 12 yrs 24% = 12 yrs 49% > 12 yrs maternal ed	32% AfA 4% AsA 36% Cau 7% Hisp 2% NatA 17% Other	Mother and/or teacher reports of externalizing were above the borderline clinical cutoff for more than half of a sample of 6-yr-old children who had been born to adolescent mothers.	Externalizing, Mother and/or Teacher Reports Boys ($n = 92$) 45.7% neither, 35.8% either, 18.5% both Girls ($n = 60$) 43.3% neither, 45.0% either, 11.7% both (proportion above borderline clinical cutoff, $T = 60$)

Walachuk et al., 1997: see "Maternal Smoking"

Child Characteristics—Biological Influences

Maternal Smoking					Key Statistics				
Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Results
Bremner, Gielin, & Mednick	1999	Prospective longitudinal 34 yrs	Population: from birth cohort, Copenhagen, Denmark, 9/59-12/61	3,728	Prenatal > 34 yrs	100%	Low-upper	N/R (Danish)	Maternal smoking during the 3rd trimester (0, 1-2, 3-10, 10-20, > 20 cigarettes/day) predicted nonviolent & violent arrests, & persistent but not adolescent-limited offending. Analyses controlled for parental psychiatric hospitalizations, perinatal complications, SES, mother's age, drug use during pregnancy, father's criminal arrest, & maternal rejection.
Ferguson, Woodward, & Horwood	1998	Prospective longitudinal 18 yrs	Population: from birth cohort, 1977, Christchurch, New Zealand, urban; 81% of original cohort	953- 1,048	Birth > 18 yrs	N/R	Low-upper	85% Cau 15% Polyn (<i>n</i> = 5)	Rates of conduct disorder symptoms were related to maternal reports at birth of smoking during pregnancy. Adolescents whose mothers reported smoking 20+ cigarettes/day during pregnancy reported over 2 times more conduct disorder symptoms in the past 2 yrs than children of nonsmokers. After adjusting for confounding & selection factors* the relationship remained & was stronger for males than females. *childhood sexual abuse, physical punishment & criminal behavior, maternal age & education, & pregnancy planning
Narano, Seidler, et al.	1989	Experiment random assignment	N/A: pregnant Sprague-Dawley rats, mini-pump inserted 4th day gestation, infusion stopped 21st day; tx: nicotine bicarbonate, 2 mg/kg/day; control: water, sodium bicarbonate	6-10+ each tx group, 2-50 days each age	18 days gestation 2-50 days postnatal	N/R	N/A	N/A	Low doses of nicotine (2 mg/kg/day) did not affect viability or growth (weight gain or litter size of pregnant rats, body & brain weight of their offspring at gestational day 18 or postnatally). However, postnatal analyses found impaired nervous system development in the nicotine-exposed group versus the control group: small increases in [³ H]-nicotine binding in midbrain & brainstem, increased ornithine decarboxylase (ODC) activity across brain regions, reduced cerebellum DNA content & concentration, & lower kidney norepinephrine levels.
Nonviolent Crime & Maternal Smoking χ^2 (1, <i>N</i> = 3,728) = 13.28, <i>p</i> < .001 OR = 1.13 (CI = 1.06-1.21), <i>p</i> < .001 (<i>p</i>'s < .05: delivery complications, drug use, SES, mother age, father crime, parent hospitalizations; <i>p</i>'s = ns: pregnancy complication, mother rejection) Violent Crime & Maternal Smoking* χ^2 (1, <i>N</i> = 3,284) = 15.74, <i>p</i> < .001 OR = 1.19 (CI = 1.09-1.30), <i>p</i> < .001 Life-Course Persistent Offending* χ^2 (1, <i>N</i> = 3,266) = 9.42, <i>p</i> < .01 OR = 1.15 (CI = 1.05-1.26), <i>p</i> < .01 Adolescent-limited χ^2 (1, <i>N</i> = 3,151) = 2.70, <i>p</i> = ns (*see study for additional significant predictors) (logistic regression analyses) Maternal Smoking & Conduct Disorder Symptoms <i>F</i> (1, 1020), <i>p</i> < .001 linear trend <i>M</i>'s = .33, .56, .57, .85 Adjusted for Confounding & Selection Factors β = -.12, <i>p</i> < .001 <i>M</i>'s = .35, .47, .40, .72 (<i>p</i>'s < .05: childhood sexual abuse, parental use of physical punishment, & parental criminal behavior) Gender Differences, Adjusted for Confounding/Selection <i>F</i> (3, 936), <i>p</i> < .001 <i>M</i>'s = .48, .76, 1.04, 1.32 male adolescents <i>M</i>'s = .20, .23, 0.26, 0.28 female adolescents (order of <i>M</i>'s: 0, 1-9, 10-19, ≥ 20 cigarettes/day) (ANOVA, multiple linear regression, ANCOVA) Prenatal Nicotine Exposure & Brain Development Postnatal development of [³H]-nicotine binding <i>F</i> (1, 83) = 14.2 fmoles/mg protein (<i>n</i> = 6-10/gp) <i>M</i>'s = 74, 77, 96, 87, 61 control <i>M</i>'s = 79, 81, 101, 94, 66 nicotine (order of <i>M</i>'s: postnatal age 2, 4, 7, 10, & 15 days) ODC activity* <i>F</i> (1, 214) = 4.4 pmols/g/hr (<i>n</i> = 8-10/group) Cerebellar DNA concentration & content* <i>F</i> (1, 90) = 5.7 mg/g concentration (<i>n</i> = 10/gp) <i>F</i> (1, 90) = 37.2 mg/g content Kidney norepinephrine levels* <i>F</i> (1, 135) = 4.8 mg/g (<i>n</i> = 6-10/gp) *Means not reported, in figures (see study for figures & nonsignificant results) (ANOVAs)									

Child Characteristics—Biological Influences

Maternal Smoking

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Walschlag, Laher, et al.	1997	Retrospective longitudinal followed for 6 yrs, T1 not predicting T6	Source specific: children referred to university psychology & psychiatry out-patient clinics in PA & GA; Developmental Trends Study	177	7-12 yrs T1 12-17 yrs T6	100%	Low-upper	25% AFA 71% Cauc	Mothers who smoked more than half a pack of cigarettes a day during pregnancy (based on retrospective reports 7-12 yrs later) were 1.5 times more likely to have a child with conduct disorder (CD) than mothers who smoked less than half a pack per day, controlling for SES & parental antisocial personality disorder (APD). Smoking continued to predict CD in models including parental psychopathologic conditions, pregnancy, family, & parenting risk factors. Maternal age, harsh discipline, & little supervision also predicted CD.	Basic Model Maternal Smoking & Childhood CD $\chi^2 = 36.2$, $df = 5$, $p < .001$ Maternal smoking OR = 3.3, CI = 1.3-8.6, $p = .01$ SES OR = 0.65, CI = 0.3-0.9, $p = .003$ Final Model Maternal Smoking & Childhood CD $\chi^2 = 56.1$, $df = 8$, $p < .001$ Maternal smoking OR = 3.3, CI = 1.2-9.0, $p = .02$ Maternal age OR = 0.90, CI = 0.84-0.97, $p = .01$ Poor supervision OR = 2.6, CI = 1.1-6.2, $p = .03$ Harsh discipline OR = 2.1, CI = 0.56-2.2, $p = .04$ (p 's = ns both models: SES, paternal APO, maternal MHP), maternal smoking less than 1/2 pack/day) (logistic regression analyses)

Weissman, Warner, et al.	1999	Prospective longitudinal 10 yrs	Source specific/ convenience: recruited parents with his of depression from bi clinics & normal controls (matched on age) from community surveys	147	6-23 yrs > 17-36 yrs M's = 16.4 > 27 yrs	48%	Low-upper 10% 1 15% 2 23% 3 42% 4 10% 5 Holdingshead	100% Cauc	The risk of developing prepubertal onset conduct disorder was 4 times greater for boys of mothers who smoked 10 or more cigarettes daily during pregnancy, than boys of mothers who did not smoke at all. Results were adjusted for maternal major depression disorder (MDD), offspring age, & divorce. The relationship was not explained by parental diagnosis, family risk factors, postnatal smoking, or prenatal/early development history. Girls whose mothers smoked had a 5 times greater risk for adolescent drug abuse/dependence.	Maternal Smoking & Offspring Psychiatric Diagnosis Male, conduct disorder before age 13 Relative risk = 4.1, CI = 1.56-10.76, $p < .01$ (adjusted for maternal MDD, offspring age, divorce) Female, drug abuse/dependence in adolescence Relative risk = 5.36, CI = 1.43-20.17, $p < .05$ (adjusted for offspring current smoking, maternal MDD, offspring age) (Cox proportional hazards regression model)
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Prenatal Exposure to Alcohol

Brown, Coles, et al.	1991	Prospective longitudinal 5-8 yrs, group comparisons	Source specific: selected mothers from earlier study who (1) drank during pregnancy, (2) stopped 2nd trimester, after alcohol education, & (3) never drank (random sample); original sample recruited from applicants for prenatal care university hospital, CA, 1980-1983	68	Prenatal > 5-8 yrs M = 5 yrs, 10 mths	44%	Low M < \$10k income/yr	94% AFA 6% N/R	Children whose mothers drank throughout pregnancy had higher teacher ratings of externalizing (including inattentive, destructive, nervous/overactive, & aggressive subcategories) & lower ratings of social competency than children of mothers who never drank, or who discontinued drinking in the 2nd trimester after alcohol education, controlling for caretaker's current drinking. Sustained attention & teacher ratings of internalizing did not differ between groups once caretaker's current alcohol use was controlled.	Behavioral Functioning, Social Competence, Teacher $F(4, 90) = 4.15$, $p < .004$ MANCOVA Externalizing $F = 8.98$, $p = .001$ M's = 52 never, 52 stopped, 64 continued Destructive $F = 4.38$, $p = .02$ M's = 60 never, 59 stopped, 66 continued Inattentive $F = 6.71$, $p = .003$ M's = 56 never, 58 stopped, 66 continued Nervous/overactive $F = 8.28$, $p = .001$ M's = 56 never, 57 stopped, 67 continued Aggressive $F = 6.00$, $p = .005$ M's = 57 never, 57 stopped, 65 continued Social competence $F = 9.73$, $p = .0004$ M's = 49 never, 46 stopped, 36 continued (covariate: mother's current absolute alcohol, oz/wk) (MANCOVAs, ANOVAs, Newman-Keuls post hoc)
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Child Characteristics—Biological Influences

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
				See previous entry	See previous entry	See previous entry		See previous entry		
Colles, Brown, et al.	1991	See previous entry	See previous entry	See previous entry	See previous entry	See previous entry			Comparisons of children whose mothers drank throughout pregnancy, discontinued drinking in the 2nd trimester, or never drank found that the drinking group had lower sequential processing & mental composite (IQ) summary scores than the other 2 groups, while the never-drank group had higher achievement scores than the other 2 groups. Math skill scores were higher for the never-drink than for the other groups, while reading/decoding scores were higher for the never-drink than the continued-to-drink group. No group differences were found for adaptive behavior. Analyses controlled for mother's current drinking (oz/wk).	Key Statistics Cognitive & Academic Functioning, Summary Scores $F(10, 114) = 7.89, p < .05$ MANCOVA Sequential $F = 3.82, p < .03$ Math skills $F = 5.64, p < .005$ Reading/decoding $F = 3.98, p < .03$ Adaptive Behavior—statistics not reported (covariate: mother's current absolute alcohol, oz/wk) (MANCOVAs, ANOVAs, Newman-Keuls post hoc)
Olson, Stretsgaard, et al.	1997	Prospective longitudinal 14 yrs	Population: selected mothers from population-based survey; oversampled for "heavy" social drinkers & infrequent drinkers; abstainers who smoked; Seattle Longitudinal Prospective Study on Alcohol & Pregnancy	464	Birth > 14 yrs	54%	Middle "primarily"	N/A/Cauc "primarily"	Prenatal exposure to alcohol (mother's report, 5th mth for mostly "social drinkers") was associated with increased behavior/learning problems in adolescence (observations & parent, teacher, youth reports) taking into account potential confounding variables in 5 areas (prenatal exposure to drugs, demographics, child characteristics, examination conditions, & postnatal environment). Binge rather than steady drinking & drinking in early rather than midpregnancy had stronger associations to outcomes.	Prenatal Alcohol Exposure & Behavior/Learning $r = .31$ (correlation between 13 alcohol measures & 186 learning/behavior measures) $r = .20, (n = 319)$ (partial correlation, 13 alcohol measures & 186 learning/behavior measures, controlling for 78 covariates, no significant interactions) (partial least squares analysis)
Delaney-Black, Covington, et al.	2000	Prospective longitudinal 6 yrs	Convenience: women screened at prenatal clinic 8/89-9/91; block sampling design, oversampled for exposure to drugs; non-HIV+, singleton births, no mental retardation at age 6 eligible for study	471	Prenatal > 6 yrs	50%	Low < 12 yrs M mat ed < \$20k M mat income	100% AHA	Prenatal cocaine exposure predicted age 6 externalizing-internalizing difference scores (teacher reports), controlling for custody change & gender. For boys, cocaine exposure was associated with a greater likelihood of clinically significant externalizing & delinquency scores.	Externalizing-Internalizing Difference, Teacher Report Model $R^2 = .10, p = .03$ Individual R^2's not reported (controls: gender, custody change) % Boys Clinically Significant Externalizing Scores Appt $M = 22.5$ exposed ($n = 94$) Appt $M = 13.5$ controls ($n = 140$) % Boys Clinically Significant Delinquency Scores Appt $M = 17$ exposed, 12 controls ($p > .05$, approximate M's from figure) (stepwise multiple regression, two-tailed t tests)

Child Characteristics—Biological Influences

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Eyler, Behrke, et al.	1998	Prospective longitudinal	Source specific: screened > 2,500 pregnant women at prenatal clinics & hospitals for cocaine users* & matched controls (race, parity, SES, location of care); eligibles: healthy, age 18+, English speakers *use cocaine & marijuana, nicotine, alcohol only	274-285	3.7-5.2 days old	N/R	Low 77% lowest Hollingshead	81% AFA 19% N/R	Alert responsiveness, general irritability, regulatory capacity, state regulation, examiner persistence, & reinforcement value of infant's behavior (Brazton subscales) were lower for infants exposed to cocaine prenatally than for nonexposed infants. Controlling for alcohol, tobacco, & marijuana use, alert responsiveness remained lower for infants exposed to cocaine & tobacco.	Prenatal Cocaine Exposure & Brazton Quotients Alert responsiveness $p = .003$, $M's = 4.7$ ctrl, 3.9 coc General irritability $p = .02$, $M's = 6.5$ ctrl, 5.9 coc Regulatory capacity $p = .02$, $M's = 5.4$ ctrl, 4.9 coc State regulation $p = .04$, $M's = 6.2$ ctrl, 5.8 coc Examiner persist $p = .02$, $M's = 4.9$ ctrl, 4.5 coc Reinforcement value $p = .02$, $M's = 6.3$ ctrl, 5.9 coc Prenatal Cocaine, Alert Responsiveness, Controlling for Alcohol, Tobacco, & Marijuana Use $p = .03$, $R^2 = .1\%$, & $M's$ not reported $p's < .05$ cocaine x tobacco, marijuana x tobacco (Wilcoxon rank sum test, multiple regression)
Lester, LeCasse, & Seltzer	1998	Meta-analysis 5 IQ studies 4 receptive 5 expressive language	N/R	8 studies $n's = 16-127$ $n = 530$, 1 IQ	Prenatal > 4-11 yrs	N/R	N/R	N/R	Children prenatally exposed to cocaine had lower IQ scores (3.26 points) than children not exposed. Effect size was small for IQ & medium for receptive & expressive language.	Prenatal Cocaine Exposure, IQ, & Language IQ effect = 3.26 (2.01) IQ points $ES = .33$ (.13) SD units Receptive language $ES = .71$ (.26) SD units Expressive language $ES = .33$ (.13) SD units (meta-analysis, Z scores, effect sizes)
Edelbrock, Rende, et al.	1995	Concurrent correlational twin study	Convenience: from birth records, same-sex twin pairs; Western Reserve Twin Project	1,011 twins	7-15 yrs	54%	Middle $M = 3.1$ (1-9) Hollingshead	N/R	Aggressive behavior, externalizing, & attention showed significant genetic effects. Delinquency showed significant shared environmental effects.	Genetic Effects ($D's = ns$: shared environment) $B = .60 \pm .22$, $p < .01$ aggressive behavior $B = .51 \pm .22$, $p < .05$ externalizing $B = .66 \pm .07$, $p < .001$ attention Shared Environment ($p = ns$: genetic) $B = .37 \pm .18$, $p < .05$ delinquency (multiple regression)
Silberg, Meyer, et al.	1995	Concurrent correlational twin study	Convenience: unselected sample recruited from Virginia schools	369 twins	11-16 yrs	100%	N/R	100% Cauc	Membership in the hyperactive/conduct disorder & multisystem group was predominantly explained by genetic effects. Membership in the pure conduct disorder group was explained by shared environmental factors.	Hyperactive-Conduct Disorder $A = .54$, $D = .34$, $E = .12$ Multisystematic Class $A = .99$, $E = .01$ Pure Conduct Disorder $A = .01$, $C = .97$, $E = .02$ Nonsymptomatic Class $A = .46$, $C = .52$, $E = .03$ $A =$ additive genes $C =$ shared environment $D =$ dominant genes $E =$ unique environment (latent class analysis)
Cadoret, Yates, et al.	1995	Concurrent correlational adoption study	Convenience: recruited from 4 adoption agencies in Iowa, biological mothers with a history of antisocial personality disorder (APD) or substance abuse & nonsymptomatic matched controls	197	10-47 yrs	49%	N/R	N/R	Conduct disorder showed genetic effects (biological parent APD) environmental effects (adoptive home environment), & genetic-environmental interaction effects (biological parent, antisocial behavior x adverse adoptive home environment). Adolescent aggression also showed genetic & genetic x environmental interaction effects.	Genetic-Environmental Factors & Conduct Disorder $R^2 = .16$, $p < .0001$ $B = .21$, $p = .01$ biological parent APD $B = .44$, $p = .0001$ adverse adoptive home enviro $B = .23$, $p = .01$ parent APD x adoptive home Genetic-Environmental Factors & Adolescent Aggression $R^2 = .19$, $p < .0001$ $B = .27$, $p = .0001$ biological parent APD $B = .31$, $p = .0001$ parent APD x adoptive home ($p's = ns$: alcoholic biological parent, prenatal exposure to stressors, & interactions with adoptive home environment) (linear regression models)

Child Characteristics—Biological Influences Genetic x Environmental Influences

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistical
Ge, Conger, et al.	1996	Concurrent adoption study	Source specific: recruited from 3 adoption agencies in Iowa; biological parents with a history of antisocial personality disorder or substance abuse & nonsymptomatic matched controls	41 sibling pairs	M = 15.8 12-18 yrs	56%	Low-middle 10-12 yrs biological 12-14 yrs adoptive parents' ed	N/R	Support for an evocative gene-environment correlation was found for youth adopted near birth. There was a moderate positive relationship between biological parents' antisocial personality &/or substance abuse & adoptive parents' harsh/inconsistent discipline. This relationship was mediated by child hostile/antisocial behavior. Results were based on adoptive parents & adoptee reports of parenting & antisocial behavior & records of biological parents.	Simple Evocative Model, Father's Discipline $r = .44$, $p < .01$ bio disorder—father discipline χ^2 (12, $N = 41$) = 10.4, $p = .53$, GFI = .94 $\beta = .16$, $p = ns$ bio disorder—father discipline $\beta = .59$, $p < .05$ bio disorder—adoptive behavior $\beta = .78$, $p < .05$ father disc—adoptive behavior Simple Evocative Model, Mother's Discipline $r = .47$, $p < .01$ bio disorder—mother discipline χ^2 (12, $N = 41$) = 7.05, $p = .83$, GFI = .96 $\beta = -.06$, $p = ns$ bio disorder—mother discipline $\beta = -.52$, $p < .05$ bio disorder—adoptive behavior $\beta = -.77$, $p < .05$ mother disc—adoptive behavior (structural equation modeling)
Niederhiser, Rieck, et al.	1999	Prospective longitudinal 3 yrs	Population: recruited same-sex sibling pairs from intact families via national marketing survey & random digit dialing; youth live at home 1/2+ time	395 sibling pairs	10-18 > 13-21 yrs	51%	Middle $M = \$23k-\$35k$ income/yr 12% < \$20k/yr 32% > \$50k/yr	94% Caucasian 6% Other	The cross-lagged relationships between parental conflict & negativity at T1 & antisocial behavior 3 yrs later were explained primarily by genetic factors. Analyses were based on composite measures (parent, adolescent, & observation) adjusted for age & gender.	Maternal Conflict-Negativity & Antisocial Behavior χ^2 (189, $N = 395$) = 390.6, $p < .05$, RMSEA = .05 100% G, 0% Es, 0% En, .17 r_{max} cross-lagged Paternal Conflict-Negativity & Antisocial Behavior χ^2 (189, $N = 395$) = 364.3, $p < .05$, RMSEA = .05 94% G, 0% Es, 6% En, .18 r_{max} cross-lagged G = genetic, Es = shared, En = nonshared environment (chi-square & root mean square error of approximation)
O'Connor, Deater-Deckard, et al.	1998	Concurrent group comparisons data collected 5 times over 6 yrs; T1 old not predict T2	Convenience: subset, sample of biological mothers recruited from 2 adoption agencies; CO, 1975-1982; Colorado Adoption Project	53-59	7-12 yrs	N/R	Low-middle biological $M = 12.1$ yrs $M = 14.7$ yrs adoptive mother's ed	95% Caucasian 5% N/R (adoptive mothers)	Children at genetic risk for child behavior problems (biological parent high on antisocial behavior) received more negative parenting (negative control) from their adoptive parents at ages 7-12 than children not at risk. These results suggest an evocative gene-environment correlation. The effect of genetic risk on negative parenting was mediated by child externalizing at each age. No genetic effects were found for positive or inconsistent parenting.	Genetic Risk & Adoptive Parents' Negative Control F (1, 57) = 6.68, $p < .05$ M 's = 30.5, 26.7, 26.6, 26.5, 28.3 at risk M 's = 25.9, 22.6, 22.8, 22.4, 23.3 norm risk order of M 's: age 7, 9, 10, 11, 12 p 's < .05: age 7, 9, 11, 12; $p < .06$ age 10 Negative Control & Externalizing Behaviors $r = .40$, $p < .01$ collapsed across waves range (r) = .25-.53, p 's < .05 Genotype-Environment Mediation, Control Behavior F (1, 49) = 2.32, $p > .10$ (control child behavior) age 7: $r = .26$, $p < .05$ to $r = .18$, $p > .05$ (ANOVA, nested measures ANOVA, partial correlation)
Gjone, Stevenson, & Sundin	1996	Concurrent correlational twin study	Population: from birth records, Norway, 1977-1979, 1983, 1986; sample higher than population on SES	915 twins	5-15 yrs	48%	N/R	100% Caucasian	Genetic and nonshared environmental influences were found for attention problems for 5-8 & 12-15 yr-old males & females.	Genetic & Environmental Influences on Attention $h^2 = .73$, $e^2 = .27$; χ^2 (4) = 3.62 males 5-9 yrs $h^2 = .76$, $e^2 = .24$; χ^2 (4) = 2.91 females 5-9 yrs $h^2 = .75$, $e^2 = .25$; χ^2 (4) = 2.92 females 12-15 $h^2 = .79$, $e^2 = .21$; χ^2 (3) = 1.89 males 12-15 h^2 = heritability, e^2 = nonshared environment (structural equation model)

Genetic Influences on Relevant Behaviors—Attention & ADHD Eidson et al., 1995: see Genetic Influences on Conduct Disorder

Child Characteristics—Biological Influences

Genetic Influences on Relevant Behaviors—Attention & ADHC

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Levy, Hay, et al.	1997	Concurrent correlational twin study	Source specific: recruited same-sex twin pairs from volunteer Australian twin registry; 1 twin with 5 attention deficit hyperactivity disorder (ADHD) symptoms	583 twins	4–12 yrs	55%	Low-middle 39% prof 41% paraprof 14% labor	N/R	ADHD had very high heritability when one twin had ADHD symptoms.	Heritability of Disorder, ADHD $h^2 = .91$, $c^2 = .13$, $t = 7.58$, $p < .001$ Heritability of Trait, $h^2 = .75$, $t = 3.51$, $p < .001$ Heritability Disorder vs. Trait, $t = .87$, $p = ns$ h^2 = heritability, c^2 = shared environment (regression models)
Sherman, McGuire, & Iacono	1997	Concurrent correlational twin study	Population: recruited from birth records, Minnesota, 1977–1981	287 twins	11–12 yrs	100%	N/R	N/R	Attention deficit hyperactivity disorder (ADHD) (teacher ratings) moderate heritability & shared environment influences. ADHD (mother ratings) had high heritability & low shared environment influences.	Heritability ADHD, Teacher Rating $A = .73$, $C = 0$, $E = .27$, $\chi^2 (4, N = 181) = .51$, $p < .97$ Heritability ADHD, Mother Rating $A = .89$, $C = 0$, $E = .11$, $\chi^2 (4, N = 194) = 3.18$, $p < .53$ A = additive genetic, E = nonshared environment C = shared environmental effects (multiple regressions, model-fitting analyses)

Genetic Influences on Other Behaviors—Harm Avoidance/Behavioral Inhibition, Empathy/Prosocial Behavior, & Difficult/Irritable/Oppositional Behavior

Cyphers, Phillips, et al.	1990	Concurrent correlational twin study	Convenience: from birth records, CO, 1982–1985, 15% of total live twin births	306 twins	1–4 yrs	N/R	Low-middle $M = 14.3$ yrs parent ad maternal ad 10–21 yrs 2–21 yrs postnatal ad	91.5% Cauc 8.5% Other	Heritability of approach/withdrawal was moderate, while environmental influences were near zero.	Genetic & Environmental Influences, Behavioral Inhibition/Harm Avoidance (Approach/Withdrawal) $h^2 \pm SE = .61 (.07)$, $p < .01$, $c^2 = .00$ Adaptability $h^2 \pm SE = .60 (.18)$, $p < .01$, $c^2 = .00$ Mood, negative $h^2 \pm SE = .51 (.20)$, $p < .01$; $c^2 = .16$, $p = ns$ Activity $h^2 \pm SE = .57 (.07)$, $p < .01$, $c^2 = .00$ Intensity $h^2 \pm SE = .65 (.06)$, $p < .01$, $c^2 = .00$ h^2 = heritability, c^2 = shared environment (multiple regression model)
Ende, Plomin, et al.	1992	Concurrent correlational twin study	Convenience: recruited from CO Dept of Health report of twin births	200 twins	14 mths	47%	Middle $M = 14.5$ yrs parent ad	1% Afri > 90% Cauc N/R% Hisp	Observations of behavioral inhibition, empathy, & activity, and parent reports of shyness & sociability showed moderate genetic influences.	Observation $h^2 (SE) = .56 (.08)$ behavior inhibition $h^2 (SE) = .36 (.08)$ empathy $h^2 (SE) = .39 (.08)$ activity Parent Report $h^2 (SE) = .28 (.08)$ shyness $h^2 (SE) = .27 (.09)$ sociability (p 's < .01; shared environment constrained to zero) (multiple regression model)
Goldsmith, Buss, et al.	1997	Meta-analysis 7 studies	N/R	1,200 twins	M 's = 1.75–9.5 yrs	N/R	N/R	N/R	Sociability, emotionality, activity, and impulsivity were influenced by moderate genetic effects.	Temperament & Genetic, Environmental Influences ICRs = .59 MZ, .10 DZ sociability ICRs = .57 MZ, .11 DZ emotionality ICRs = .64 MZ, .08 DZ activity ICRs = .66 MZ, .15 DZ impulsivity (meta-analysis, weighted intraclass correlations)

Family Factors and Processes

This section focuses on children's immediate social environment, including those who live with and influence them on a regular and personal basis. The primary focus is on qualities of family social interaction that either increase or reduce the risk of developing externalizing behavior problems and conduct disorder. These interaction qualities have been categorized into six domains: engagement/ attentiveness versus disengagement/ inattentiveness; validation versus invalidation; firm discipline and conflict management versus harsh, inconsistent discipline and escalation of conflict; effective problem solving versus ineffective problem solving; structure versus lack of structure in the learning environment; and modeling of norm-maintaining behavior versus modeling of antisocial behavior.

These domains were developed at a level sufficiently general to characterize interaction across development, spanning infancy, toddlerhood, middle childhood, early adolescence, and late adolescence. In many cases, the specific behaviors that reflect a given domain will look quite different across different periods of development, because it is important to take into account the growing sophistication and contributions of the child in family interactions.

It is also important to note that each domain of family interaction is shaped by and responds to a number of other factors that have received considerable attention, such as characteristics of individual family members (attitudes, presence of

psychopathology) and characteristics of the social context (family structure and transitions). These factors can exert powerful effects. For example, research on family structure and transitions has shown that adolescents are at increased risk for conduct problems if they live in single-parent families or have experienced multiple transitions in family composition or residence (Aneshensel & Sucoff, 1996; Henry, Caspi, Moffitt, & Silva, 1996; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Smith & Jarjoura, 1988). The reasons for these effects, however, are not clear. Indeed, some studies have shown these effects to be mediated by more immediate and malleable family processes (e.g., engagement, discipline) (Harnish, Dodge, & Valente, 1995). Although such factors help to identify potential target populations for interventions, the focus of the present review will be on family interaction qualities that either have been shown to be or may be malleable risk processes that would serve as targets for interventions.

Another important context for family interaction is that of culture. Indeed, some argue that processes within the family are the primary means by which culture is expressed. However, there is limited research on cultural differences in family processes related to externalizing behavior problems. The most serious gap is in research with Native American and Asian-American populations. Also, very few studies with diverse samples have included young children (ages 0-5). Finally, available research with African-American and

Hispanic populations is almost exclusively based on low-income, inner-city, high-risk samples. Where available, cultural generalizability and distinctions will be mentioned in the following review of family processes.

The first three domains of interaction—engagement, validation, and discipline/conflict—account for the lion's share of studies to date. Many of the studies measured more than one aspect of parenting, and there is substantial evidence that engagement, validation, and discipline/conflict tend to correlate with each other. This point has not gone unnoticed in intervention work. It is typical for interventions targeting family processes to emphasize more than one process, such as engagement, validation, and discipline. Research in this area has not tested experimentally the effects of interventions aimed at distinct domains of interaction before building comprehensive preventive interventions.

Engagement/Attentiveness Versus Disengagement/ Inattentiveness

In infancy and toddlerhood, the concept of engagement has been studied in terms of mother-infant responsiveness and infant attachment security (i.e., quality of the affective bond between infant and caregiver). Evidence indicates that the quality of early parental engagement predicts infant attachment security and that both parental engagement and infant attachment predict the development of early onset externalizing problems (Lyons-Ruth, Alpern, & Repacholi, 1993; Shaw, Keenan, & Vondra, 1994; van den Boom, 1994). Maternal unresponsiveness during infancy has been shown to predict later child externalizing behavior problems (Shaw et al., 1994). Also, there is evidence that avoidant and disorganized attachments during infancy predict later parental and teacher reports of externalizing behavior

problems in preschool (Erickson, Sroufe, & Egeland, 1985; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). This result also has been demonstrated among higher risk samples (e.g., low income, parental psychopathology) (Lyons-Ruth et al., 1993).

Additional work indicates that the relationship between parental responsiveness and infant attachment security and child behavior problems may be moderated by child gender and negativity. Several studies have found the impact of maternal responsiveness and attachment security to be more pronounced for boys than girls (Shaw et al., 1994). Other work indicates that it is the combination of infant negative emotionality and attachment security that places children at greater risk for externalizing behavior problems rather than attachment security alone (Shaw et al., 1996).

Several early intervention programs with a primary focus on changing mother-infant responsiveness and engagement have provided evidence suggesting that these early family processes are causal risk factors for child conduct problems. Through intervention, early maternal unresponsiveness can be changed, and this change, in some cases, was related to more secure infant attachment (van den Boom, 1994; van Ijzendoorn, Juffer, & Duyvesteyn, 1995; Wendland-Caro, Piccinini, & Millar, 1999). In addition, a well-known early intervention that included changes in early maternal engagement, validation, and problem solving (in addition to other forms of maternal support) showed long-term effects on reducing conduct problems in adolescence (Olds et al., 1998).

Interestingly, the issues of parental responsiveness and engagement have received less attention in preschool-aged children. The limited research suggests that lack of parental supervision and attention during this period of development predicts increased aggression and delinquency in grade school boys (Haapasalo & Tremblay, 1994).

Similarly, interventions that have addressed parental engagement (as well as validation, discipline, and problem solving) during toddlerhood have been successful in decreasing later childhood externalizing behavior problems (Sheeber & Johnson, 1994; Webster-Stratton, 1998; Webster-Stratton, Kolpacoff, & Hollinsworth, 1988). Thus, evidence exists that parental engagement continues to be a causal risk factor during toddlerhood.

In middle childhood and early adolescence, the concept of engagement has been studied in terms of the amount of time spent with the child, the degree of attentiveness, and monitoring of the child's activities. Consistent evidence indicates that greater involvement, stronger focus of attention, and higher levels of monitoring are related concurrently to lower levels of conduct problems and predict lower risk for developing delinquency or criminal activity (Farrington & Hawkins, 1991; Fridrich & Flannery, 1995). There is some evidence that the lack of parental monitoring may be of particular importance in middle childhood; it was found to be a stronger predictor of early arrests (prior to age 15) than of later arrests (Farrington & Hawkins, 1991; Patterson & Yoerger, 1995). Also, some research indicates possible reciprocal effects between monitoring and delinquency in the period from 13 to 15 years, with weak monitoring promoting delinquency, which, in turn, further erodes monitoring (Jang & Smith, 1997).

Monitoring and involvement continue to show effects on conduct problems into adolescence. During middle and late adolescence, engaged parenting has been related to a reduction in antisocial behavior over time (Aseltine, 1995; Barnes, Farrell, & Banerjee, 1994; Simons, Johnson, Conger, & Elder, 1998). Although the total effect of engagement is low to moderate, the fact that it continues to have a direct impact is important in light of the impact of peer characteristics, personal characteristics, and other environmental factors operating at this period of

development. Moreover, even small reductions in rates of serious conduct problems can yield very significant economic, health, and social benefits.

The concurrent and predictive associations of parental engagement during middle childhood and adolescence also are seen in research with African-American and Hispanic families (Forehand, Miller, Dutra, & Chance, 1997; Fridrich & Flannery, 1995). Although the effects range from mild to moderate, the consistency of findings indicates that poor parental engagement is a significant predictive risk factor for youth conduct problems in African-American and Hispanic families. A number of intervention trials have included parental monitoring among the family process variables to target in intervention (Patterson, Chamberlain, & Reid, 1982; Wahler, Cartor, Fleischman, & Lambert, 1993). During middle childhood and adolescence, results of these programs consistently show parental monitoring as a causal risk factor for reducing adolescent conduct problems (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991; Tremblay et al., 1991), with stronger effects found when parents are encouraged to extend their supervision and monitoring to the peer and academic setting (Borduin et al., 1995). Although interventions that include improved parental monitoring also have shown effects for youth already involved in criminal behavior, stronger effects are found in therapeutic foster homes where parental monitoring is enhanced (Chamberlain & Reid, 1998).

Validation Versus Invalidation

"Validation" refers to behavior likely to comfort children, increase their sense of security, or communicate that they are valued and valuable. "Invalidation" refers to behavior that is physically painful, increases a sense of insecurity, or communicates to children that they are deficient, defective, or not valuable.

The impact of invalidation has been studied in infants by measuring their response to hostile and rejecting behavior. Evidence consistently shows that such parental behavior is correlated with externalizing behavior problems (Belsky, Hsieh, & Crnic, 1998; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Shaw et al., 1998). This effect appears to be as robust for girls as for boys, and for middle-SES as well as lower-SES families. It has been found in both European-American and African-American families. In much of the work, parental hostility precedes the onset of externalizing behavior problems. However, some research indicates that parent hostility and rejection may co-occur with child early disruptive behavior and negative emotionality, reflecting a more interactive and mutually escalating parent-child interaction pattern (Shaw et al., 1998).

Parental warmth and hostility continue to show moderate to strong effects during toddlerhood (Campbell, Breaux, Ewing, & Szumowski, 1986; Stocker, 1993) and middle childhood (Metzler, Biglan, Ary, & Li, 1998), and a persistent but lower effect in early adolescence (Conger & Conger, 1994; Conger, Ge, Elder, Lorenz, & Simons, 1994). Parental validation and warmth correlate and predict lower levels of externalizing behavior and delinquency (Feldman & Weinberger, 1994; Scaramella, Conger, & Simons, 1999; Stocker, 1993), while parental hostility, criticism, and rejection correlate with and predict disruptive youth behavior (Campbell et al., 1986; Conger & Conger, 1994). Although the effect sizes tend to be small, parental validation/invalidation has been shown to be a predictive risk factor across African-American, European-American, and Hispanic families (Brody, Stoneman, & Flor, 1996; Harnish et al., 1995; Knight, Virdin, & Roosa, 1994; Lindahl, 1998). Changes in parental warmth that accompany changes in parental engagement, monitoring, and discipline have been shown to lead to reductions in child and adolescent conduct problems (Webster-Stratton, 1998).

As in the case with young children, there is evidence to support interactive effects between parental hostility and middle childhood conduct problems. However, as children move into early adolescence, some evidence suggests that child conduct problems predict reductions in parental warmth but not the converse (Jang & Smith, 1997). Thus, in childhood and adolescence, modest to moderate predictive effects have been documented for parental invalidation and problem behavior. In addition, results of several intervention trials indicate that parental validation, when combined with other family processes, can be modified and serve as a causal risk factor for child and adolescent conduct problems (Borduin et al., 1995; McNeil, Eyberg, Eisenstadt, Newcomb, & Funderbunk, 1991; Patterson et al., 1982; Tremblay et al., 1991; Webster-Stratton, 1998; Webster-Stratton et al., 1988).

Firm Discipline and Conflict Management Versus Harsh Discipline and Conflict Escalation

"Firm discipline" refers to parental strategies for managing and controlling child behavior that consistently use rules and set limits, provide reasons for the rules, and offer nonpunitive consequences for rule breaking. "Harsh discipline" refers to nonabusive parental strategies for controlling child behavior that may involve inappropriate or inconsistent use of rules, little reasoning, and punitive or excessively negative reactions to rule breaking. Frequently, these parental strategies are studied within the context of parent-child conflict and the ability to manage calmly and resolve conflicts rather than engaging in coercion and escalating conflict.

As early as age 2, parental use of coercion has been identified as a predictive risk factor for

externalizing behavior problems at school entry (Crockenberg & Lourie, 1996; Fagot & Leve, 1998). Similarly, evidence indicates that negative parental control and harsh parental discipline during toddlerhood predict increased risk for child aggression and externalizing behavior problems one, two, and five years later (Campbell, 1994; Campbell, March, Pierce, Ewing, & Szumowski, 1991; Campbell, Pierce, Moore, Marakovitz, & Newby, 1996). Some of this work has examined the role of early child negative emotionality and finds that both child negativity and parental coercion predict child behavior problems (Kingston & Prior, 1995; Schwartz, Dodge, Pettit, & Bates, 1997).

In middle childhood, and in early and later adolescence, consistent relationships between highly conflictual, inconsistent, harsh, and restrictive parenting and child externalizing, delinquent, and antisocial behavior have been found in research using concurrent correlational designs (Knight et al., 1994; Sampson & Laub, 1994; Shumow, Vandell, & Posner, 1998). Predictive longitudinal studies also indicate that harsh and inconsistent parenting predicts later youth conduct problems (Patterson et al., 1998; Wasserman, Miller, Pinner, & Jaramillo, 1996). However, the direction of this influence may change over time, with a reciprocal relationship between disciplinary style and antisocial behavior in early and middle childhood, but fading reciprocity as the child moves into adolescence (with parental behavior predicting child behavior) (Cohen & Brook, 1995). Also, there is some evidence that the experience of parental punitive discipline may more strongly predict early childhood behavior problems than it does adolescent conduct problems (Feehan, McGee, Stanton, & Silva, 1991). It is important to note, however, that modest to moderate effects of parental discipline and parent-child conflict with externalizing behavior problems still are detected in adolescence (Neighbors, Forehand, & Bau, 1997;

Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994).

Evidence exists that the effects of parental discipline and conflict management may vary as a function of ethnicity and community context. Several studies have documented concurrent correlations and predictive risk between harsh or inconsistent parental discipline, or both, and child/adolescent conduct problems in African-American and Hispanic samples (Knight et al., 1994; Lindahl, 1998), but other studies have found different effects. For example, harsh discipline had different effects on European-American and African-American children. In a study of children in early elementary school, physical discipline (e.g., spanking) predicted increased externalizing behavior for European-American but not for African-American children (Deater-Deckard, Dodge, Bates, & Pettit, 1996). These differences, however, were significant only in the nonabusive range of corporal punishment; physically abusive parenting is associated with antisocial behavior for both African-American and European-American children (Dodge, Pettit, Bates, & Valente, 1995; Shumow et al., 1998). In adolescence, unilateral parental decision making was related to fewer conduct problems among African-American youth and was unrelated to externalizing behavior problems among European Americans, Hispanics, and Asian Americans (Lamborn, Dornbusch, & Steinberg, 1996).

Parental discipline and conflict management have been primary targets for many intervention programs. These trials have consistently documented that improvement in these aspects of parenting leads to improvements in child and adolescent conduct (Webster-Stratton, 1998). Beginning in toddlerhood, through middle childhood and adolescence, interventions that include improvement in parental discipline, in addition to monitoring and validation, show reductions in youth conduct problems and antisocial behavior (Bank et al., 1991; Patterson

et al., 1982; Tremblay et al., 1991; Wahler et al., 1993). For adjudicated youth, improvements in parental discipline have stronger effects on youth conduct when parents are supported to intervene in peer and academic settings outside the home (Borduin et al., 1995). Also, therapeutic foster home placements that emphasize effective parental discipline have shown significant reductions in delinquency among adjudicated youth (Chamberlain & Reid, 1998). Thus, there is substantial evidence that parental discipline and conflict management are causal risk factors for child and youth externalizing behavior problems and conduct problems.

Family Problem Solving

"Family problem solving" refers to behaviors that aid in exploring a given problem and that generate potential solutions. For young children this also includes parental exploration of problems, helping to give structure to the situation and encourage prosocial means of understanding the situation. Although a relatively large body of research has examined basic family problem solving, little of this research has been directed toward understanding externalizing behavior problems. This is striking because many family-based interventions use training in problem solving as part of the intervention package.

The limited work that has been conducted suggests that parental problem solving, from the early years of child development through adolescence, is correlated with less problematic child and adolescent behavior. In early childhood, parental exploration of child emotional experiences, particularly anger and sadness, has been correlated with fewer behavior problems (Hooven, Gottman, & Katz, 1995; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). There is some evidence that poorer family problem solving in middle childhood may predict later delinquent behavior (Coughlin &

Vuchinich, 1996; Vuchinich, Wood, & Vuchinich, 1994). However, it tends to be associated with other problems in parenting (e.g., engagement, discipline) and, in general, accounts for less of the variance in externalizing behavior outcomes than engagement, discipline, and validation. Some research indicates, however, that changes in family problem solving can lead to reductions in child aggression (Sayger, Horne, Walker, & Passmore, 1988).

Parental Structuring of the Learning Environment

Parents and families can structure children's time in ways that enhance access to learning opportunities in the home, neighborhood, or community and protect children from negative environmental influences. Although this concept is theoretically and practically relevant, there is little research regarding the influence of family structuring of children's time and activities on externalizing behavior problems.

Research to date, conducted with school-aged children and adolescents, suggests that families that encourage involvement with school and maintain contact with the school have children who show fewer problematic behaviors than do families that are less involved with school (Jenkins, 1997; Ketsetzis, Ryan, & Adams, 1998). Also, parents who provide firm discipline and monitoring of their adolescents tend to have children who become involved with peers with similar parental discipline styles (Fletcher, Darling, Steinberg, & Dornbusch, 1995). Being involved in networks of this type appears to be protective against delinquency, because parental monitoring protects against association with deviant peers (Aseltine, 1995). These few findings suggest that parental structuring correlates with child conduct; however, more research is needed to determine the

predictive and possible causal relationship with conduct problems.

Family Modeling of Norm-Maintaining Versus Antisocial Behavior

Family modeling of norm-maintaining behavior involves exposing the child to prosocial behavior versus rule-breaking and antisocial behavior by other family members. Three different types of evidence can be used to support the contribution of family modeling in externalizing behavior problems.

A sizable body of literature has examined whether the presence of antisocial behavior, delinquency, or criminal behavior in other family members places children at increased risk for similar behaviors. Much of this work has found increased risk when mothers, fathers, or siblings were rated as more antisocial or had a history of delinquency or criminal behavior (Farrington & Hawkins, 1991).

It is not known whether this increased risk stems from modeling; from poorer parental discipline, monitoring, and engagement; or from sharing some common genetic predisposition.

A second body of literature concerns the relationship between marital conflict and child outcomes, where greater marital discord is assumed to model behaviors relevant to externalizing behavior problems in children. Research over three decades documents modest to moderate correlations between parental conflict and children's externalizing behavior problems. Younger and older children appear to be comparably influenced by parental conflict (Brody et al., 1996; Jouriles et al., 1991). Family conflict in more than one area (i.e., parent-parent, parent-child, sibling-sibling) is correlated with child aggression (Schwartz, Dodge, Pettit, & Bates, 1997). This pattern continues to be seen among

adolescents, where greater marital discord is modestly correlated with increased delinquency and problem behavior in both boys and girls (Davies & Windle, 1997; Mekos, Hetherington, & Reiss, 1996; Neighbors et al., 1997). Again, it is not clear whether these effects are due to modeling, disruptions in parenting behavior, increased physiological dysregulation, or some combination of these factors.

A third, more poorly documented area of literature focuses on parental values, attitudes, or beliefs concerning deviance and law-abiding behavior. These few studies have found evidence of a correlation between parental antisocial attitudes and externalizing behavior problems/youth offending (Gorman-Smith, Tolan, Loeber, & Henry, 1998). However, additional research is needed to examine these relationships for younger children and to support predictive relationships.

Implications for Malleable Family Risk Factors and Developmental Processes

It is clear from the research that a number of aspects of family interaction can increase the risk for developing externalizing behavior problems from early childhood through adolescence. Specifically, lower levels of engagement, greater use of invalidation, and harsh and inconsistent discipline have all been identified as causal risk factors for the development of externalizing behavior problems. Although parental problem solving, structuring of the learning environment, and modeling of normative behavior show some correlation with the development of conduct problems, research on these processes has not advanced to a level where inferences about predictive or causal risk can be made soundly.

It is important to note that the three most frequently studied family processes—engagement,

validation, and discipline—also tend to correlate strongly with one another. This is to say that parents who are less engaged also tend to be less validating and to use harsher and less consistent discipline. Thus, it is not surprising that empirically driven family-focused intervention trials typically target all three processes. These trials have provided evidence for the malleability of these processes and the causal nature of the relationship by demonstrating that intervention can substantially decrease child externalizing behavior problems. Interventions beginning during pregnancy and extending into the second year of life have shown consistent effects on these parenting processes. Indeed, one such early intervention trial has shown long-term effects on serious delinquent behavior during adolescence. Also, a number of randomized trials have tested interventions aimed at families of preschoolers and young children in elementary school. These trials have consistently shown both immediate and longer term reductions in externalizing behavior problems. Similarly, in later childhood and adolescence, randomized trials aimed at family processes have shown effects.

Given these important intervention results, it is imperative that strategies for enhancing family interactions be transported and implemented in community services and mental health practice. Research is needed that identifies opportunities within communities for providing effective interventions, explains how to provide the interventions cost-effectively, and develops community infrastructure and buy-in for sustaining the interventions. In many cases, this process will involve building collaborative relationships with community leaders and policymakers, as well as people in other scientific disciplines such as community psychology, sociology, and social work.

In addition to the effectiveness and dissemination research needed on established risk factors and interventions, further research is needed on the predictive and potentially causal role of family/ problem solving, structuring of the learning environment, and family modeling. Do these processes significantly contribute to conduct problems over and above the effects of engagement, validation, and discipline? Are there developmental periods in which some family processes are more influential than others? When family processes are disrupted, does this increase the child's vulnerability to being affected by factors in other domains, such as characteristics of the child, the peer group, the school, and the neighborhood? This last question is particularly challenging, given the wide array of factors that could be influential at any given time. However, considering these interaction effects—which involve the child, the family, the peer group, and the broader social environment—may prove to be the most insightful for developing interventions for real-world settings.

Whether conducting future research on the effectiveness and dissemination of interventions or studying basic processes of family problem solving, structuring of the learning environment, or modeling, scientists must address cultural issues. The research to date on cultural effects has suggested some interesting distinctions, particularly in the study of parental discipline. It is essential for future research on family processes relevant to conduct problems to include diverse ethnic samples and methodologies sensitive to potential cultural distinctions. These efforts will provide not only a richer empirical understanding of how risk factors are similar or differ across ethnic groups but also a much stronger base on which to develop interventions relevant to the world's diverse population.

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Table 2: Family Factors and Processes—Research Summaries

Authors	Year Design	Representativeness	Size	Age*	% Male	SES**	Ethnicity	Result	Key Statistics
Aneshensel & Suzoff	1996 Concurrent correlational	Population: 3-stage probability sample of Los Angeles County, CA—canon tract, blacks, & households; screened for 12–17-y-old permanent residents; Latino youth over-represented; non-Hispanic whites under-represented	877	12–17 yrs	54%	Low-upper Med = \$28,750 27% poverty 26% managers	11% AfriA 11% AfriA 26% CauC 49% Hsp* 4% Other *40% MexAm 39% MexAm 11% Salvdn 3% GuamIn 4% CnV/S Am 4% Other	Oppositional defiant disorder was associated with single-parent families, middle-class Latino & non-Hispanic white neighborhoods, high SES, older youth, & perception of ambient hazards in neighborhood.	Oppositional Defiant $R^2 = .34$, $F(17, 857) = 7.94$ $p = .12$, $p < .01$ single parent $p = -.17$, $p < .001$ working-class nhood, Afri-Am $p = .14$, $p < .05$ middle-class nhood, wh & Lat (p 's < .01 = .001); income, age, percept ambient hazards (models included neighborhood clusters (SES, % AfriA, % Lat); nhood stability; perceptions of nhood: ambient hazards & social cohesion; adolescent attributes: same house 5+ yrs, AfriA, Lat, per capita income, age, female; & family structure: intact nuclear or single parent) (multiple regression)
Henry, Caspi, et al.	1996 Prospective longitudinal 15 yrs	Population: consecutive births, spring 1972–1973, Dunedin, New Zealand	475	3 > 18 yrs	100%	Low-upper 39% 1–3 39% 4 22% 5–6 1 hi–6 low paternal occupation	93% CauC < 7% Maori, Polynesian	Risk for a nonviolent conviction by age 18 was increased by residing in a single-parent family by age 13 & the interaction of age 3–5 lack of control & living with a single parent by age 9. Risk for a violent conviction by age 18 was increased by the number of residence changes by age 13, lack of control at ages 3–5, & the interaction of lack of control & number of parent changes by age 9.	Nonviolent Conviction vs. No Conviction $\chi^2(4, N = 345) = 15.7$, $p < .01$ main effects $\chi^2(3, N = 345) = 7.6$, $p < .05$ interactions OR = 1.94, $r = .56$, $p < .01$ # parent changes M 's = .58 nonviolent, .16 no conviction OR = 1.73, $r = .55$, $p < .05$ control = single parent Violent Conviction vs. No Conviction $\chi^2(4, N = 315) = 28.3$, $p < .01$ main effects $\chi^2(3, N = 315) = 9.1$, $p < .05$ interactions OR = 1.52, $r = .42$, $p < .05$ lack of control OR = 1.33, $r = .28$, $p < .01$ # residence changes M 's = 3.11 violent, 1.74 no conviction OR = 1.43, $r = .36$, $p < .05$ control = # parent ch (logistic regression analyses)
Patterson, Forgatch, et al.	1998 Prospective longitudinal 10 yrs	Population: recruited from all 4th-grade boys in 11 randomly selected schools, neighborhoods with high delinquency rates, metro area, mid-size Pacific NW city	206	9–10 > 18 yrs	100%	Low-middle Med = \$15K	N/R% CauC "majority"	Number of marital transitions predicted risk for early onset arrest (by age 14) & chronic offending (by age 18), taking into account social disadvantage, effective discipline, & parental monitoring.	Early Onset Arrest (by age 14) $p = .50$, $p = .006$, exp $b = 1.66$ marital transitions Chronic Offending (by age 18) $p = .42$, $p = .02$, exp $b = 1.52$ marital transitions (both models: p 's < .05: social disadvantage, effective discipline, p 's < .10: parental monitoring) (logistic regressions)
Smith & Jarjoura	1988 Concurrent correlational	Population: random sample, 200 households, 57 neighborhoods, 3 SMSAs: Tampa-St. Pete, Ft. St. Louis, MO, & Rochester, NY; 1977; data aggregated by neighborhood	57 nhoods 11,419 residents	N/R	N/R	N/R	N/R	Violent crime rates (resident reports) were predicted by the interaction of low income (under \$5,000) and residential mobility, % single-parent households, population density, & % age 12–20 yrs. taking into account low income, residential mobility (main effects), % nonwhite, % living alone, racial heterogeneity, & location.	Violent Crime Rates $R^2 = .63$ $p = .002$, $r = 2.70$ mobility × low income $p = .02$, $r = 1.89$ % single-parent household $p = .52$, $r = 2.64$ population density $p = .36$, $r = 2.91$ % ages 12–20 (p 's = ns: % low income, residential mobility, city, racial heterogeneity, % nonwhite, % living alone) (OLS regressions)

Note: Please check "Ethnic Minority Populations" and "Treatment & Preventative Interventions" sections for additional citations.

* > indicates that data at first age are used to predict data at second age.

** Unless otherwise indicated, income is reported in yearly amounts.

Family Characteristics—Engagement/Disengagement Ages 0–3

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Results	Key Statistics
Ericson, Sroufe, & Egeland	1985 Prospective longitudinal 4 yrs	Convenience: high-risk mothers recruited from urban public health clinics, MI	96	12 > 60 mths	54%	Low 41% < 12 yrs maternal ed	13% AFA 80% Cauc < 7% Hisp < 7% N/A (mother)	Anxious/avoidant attached children at 12 & 18 mths were rated by preschool teachers as more hostile than anxious/ resistant children & more exhibitionist/impulsive & less compliant than secure or anxious/resistant children.	Hostility $F = 3.36, p = .04$ $M's = .25$ AA, $-.71$ AA Impulsivity $F = 5.32, p = .008$ $M's = .56$ AA, $-.23$ secure, $-.39$ AR Compliance $F = 3.53, p < .04$ $M's = 4.30$ AA, 5.58 secure, 5.60 AR AA = anxious/avoidant, AR = anxious/resistant (ANOVA, Student Newman-Keuls post hoc comparisons)
Lyons-Ruth, Alpern, & Repacholi	1993 Prospective longitudinal 3.5 yrs	Convenience: recruited from infant study of high-risk, low-income families; 3 same-sex class- mates, matched on birth date, were controls	62 dyads 182 classm controls	18 mths > 5 yrs	60%	Low 46% < 12 yrs ed	N/A, AFA N/A, Cauc N/A, Hisp *23% of families included minority parent*	Infant attachment security, maternal home hostile-intrusive behavior during infancy, & maternal history of perinatal problems* predicted teacher ratings of preschool children's deviant hostile behavior toward peers, controlling for classroom's behavior. Children with disorganized infant attachment were rated more hostile than securely attached children. *current depression, its child maltreatment, psychiatric hospitalization	Preschool Hostile Behavior, Teacher Ratings $F(5, 55) = 2.33, p < .04$, Wilks's $\lambda = .80$ $\phi = -.36, p < .01$ infant security attachment $\phi = .31, p < .05$ maternal psychosocial problems $\beta = .24, p < .05$ maternal hostile-intrusiveness (controlling for classroom behavior score) (multiple regression, ANOVA or chi-square) Infant Attachment Security: Disorganized vs. Secure $\chi^2(1, N = 50) = 6.20, p < .01, \phi = .40$ 81% nondeviant, 9% deviant secure 56% nondeviant, 44% deviant disorganized (chi-square)
Shaw, Maenon, & Vondra	1994 Prospective longitudinal 2 yrs	Convenience: high-risk mothers recruited from WIC program, metro Pittsburgh, PA, area	82	12 mths > 3 yrs	59%	Low 73% < \$12k 74% < 12 yrs maternal ed	39% AFA 61% Cauc	Maternal responsiveness (observed at 12 mths) was correlated with maternal ratings of aggression at age 2 & externalizing at age 3 for boys but not girls. Multivariate analyses found that maternal responsiveness & infant noncompliance at 18 mths predicted age 2 aggression for boys after accounting for infant persistence at 12 mths. Maternal responsive- ness interacted with boys' aggression at age 2, & marginally predicted maternal ratings of externalizing at age 3. No significant predictors were found for girls.	Aggression Age 2, Maternal Responsiveness 12 Mths $r = -.32, p < .05$ boys; $r = .04, p = ns$ girls Multivariate, Boys $F(3, 41) = 4.09, p < .02$ Maternal responsiveness 12 mths $R^2 = .23, \Delta R^2 = .09, F(3, 41) = 4.09, p = .04$ ($p < .05$: infant noncompliance, $p < .10$: persistence) Externalizing Age 3, Maternal Responsiveness 12 Mths $r = -.28, p < .05$ boys; $r = -.05, p = ns$ girls Multivariate, Boys $F(3, 35) = 4.85, p < .007$ Maternal response 12 mths + aggression age 2 $R^2 = .30, \Delta R^2 = .07, F(3, 35) = 4.85, p = .08$ Global aggression 12 mths $R^2 = .20, \Delta R^2 = .20, F(1, 37) = 8.88, p = .005$ ($p < .10$: maternal responsiveness) (hierarchical multiple regression)
Shaw, Owens, et al.	1996 Prospective longitudinal 4 yrs	Convenience: high-risk mothers recruited from WIC program, metro Pittsburgh, PA, area	77	12 mths > 5 yrs	59%	Low 73% < \$12k 74% < 12 yrs maternal ed	39% AFA 61% Cauc	Aggression at age 5 was predicted by observed disorganized attachment at 12 mths, maternal ratings of infant difficulty during yr 2, & the attachment by difficulty interaction. Children exhibiting disorganized attachment and high difficulty had higher aggression scores than children with 1 or neither risk factor.	Aggression Age 5 $F(3, 72) = 7.94, p < .001$ $\Delta R^2 = .11, p < .003$ disorganized attachment yr 1 $\Delta R^2 = .07, p < .02$ infant difficulty yr 2 $\Delta R^2 = .06, p < .02$ disorg attach + infant diff $F = 8.27, p < .001$ interaction $M = 72.0$ disorg attach & > A5th infant diff $M = 59.7$ above A5th infant difficulty $M = 57.5$ disorganized attachment $M = 58.1$ neither risk factor (stepwise multiple regression, ANOVA)

Family Characteristics—Engagement/Disengagement

Ages 0–3

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Van den Boom	1994 random assignment followup 1 interactions, followup 2 attachment	Source specific: located low SES families through birth registry & midwives in Leiden, Netherlands; aided; selected firstborn infants; high on irritability; IV took place at home, three two-hr sessions over 3 mths	100 dyads	6 mths > 9, 12 mths	47%	Low	100% Cauc (Netherlands)	Compared to controls, dyads in the maternal responsiveness intervention group showed effects on <i>maternal</i> & <i>infant</i> interactive behavior (mother more responsive, visually attentive, stimulating, & controlling of behavior while infants more self-soothing, sociable, & exploring), <i>infant</i> explora- tion (more sophisticated exploring & less mouthing), & <i>infant attachment</i> (IV group more likely to be securely than insecurely attached at 12 mths).	Maternal Interactive Behavior, Responsiveness $F(1, 96) = 176.8, p < .001$; $M's = 4.3$ IV, -1.8 ctrl ($p's < .001$: stimulate, visual attention, control behavior*) Infant Interactive Behavior, Sociable $F(1, 96) = 31.7, p < .001$; $M's = 1.4$ IV, 2.2 ctrl ($p's < .001$: self-soothing, exploring*) Infant Exploring, Mouthing $F(1, 96) = 4.61, p < .05$; $M's = -.31$ IV, $.31$ ctrl ($p < .001$: sophisticated exploring*) Quality of Attachment* $\chi^2(1) = 16.96, p < .001$ 38% IV, 78% ctrl insecure; 62% IV, 28% ctrl secure (*see study for additional results) (2 × 2 MANOVAs, log-linear analyses)

Ages 4–6

Huopala & Tremblay	1994 Prospective longitudinal 8 yrs	Population: boys in 53 public schools in low-SES area, Montreal, Canada rated by kindergarten teachers; only boys with Canadian-born, French-speaking parents, < 15 yrs old eligible	948	6 yrs > 14 yrs	100%	Low $M = \$21k$ (US) $M = 10.5$ yrs maternal ad	100% Cauc	Boys classified as nonfighters from ages 6–12 reported more supervision, less punishment, & fewer rules at ages 10–12 than fighters. High supervision, low fighting behavior between ages 10–12, low punishment, & low family adversity reduced the likelihood of being involved in delinquency at age 13 & 14.	Fighter Group Status, Nonfighters Wald's $\Delta = 0.92$, $df = 5.76, p < .001$ $F(4, 877) = 8.43, p < .001$ supervision $F(4, 877) = 5.83, p < .001$ punishment $F(4, 877) = 4.46, p < .001$ rules at home (MANOVA, Newman-Keuls) Delinquency Age 13 $\chi^2 = 782.06, p = .39$ $\beta's = .07$, Wald (1) = 0.03, $p = .46$ family adversity $\beta's = -.12$ to $-.05$, Wald = 3.6–17.6, $p's = .00$ to $.056$ fight grp $\beta = .12$, Wald (1) = 4.33, $p < .05$ supervision (stepwise logistic regression, step 1 forced)
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Ages 7–13

Farrington & Hawkins	1991 Prospective longitudinal 24 yrs	Population: sampled all boys ages 8–9 from 6 state primary & 1 special ed school, working- class area of London, 1961–1962	411	8–9 > 32 yrs	100%	Low 23% < 4.15 30% > 4.20 income/wk	90% Cauc < 10% W Ind < 10% Cryptol	Low paternal involvement in leisure activities ages 8–10 was the strongest predictor of early convictions (10–13) & persistence of offending between ages 21 & 32. High troublesomeness, authoritarian parents, poor psycho- motor skills, & convicted parent also predicted early convictions while heavy drinking, low commitment to school, poor housing, low verbal IQ, & unemployment predicted persistence. Poor parental supervision increased the likelihood of a criminal conviction.	Early Offending, Ages 10–13 $R^2 = .46$ ($n = 128$) $R = .28$, $\Delta F = 7.51, p < .01$ time with father Reconvicted Ages 21–32 $R^2 = .50$ ($n = 124$) $R = .25$, $\Delta F = 5.80, p < .05$ time with father (see study for additional predictors) Parental Supervision & Likelihood of Conviction $\chi^2 = 20, p < .001$ ($N = 411$) 48.6% poor parental supervision—conviction 25.6% not poor supervision—conviction (stepwise multiple regressions, chi-square)
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Jiang & Smith	1997 Prospective longitudinal 1.5 yrs T1 = parenting wave 2 controls wave 2 delinquency wave 3 T2 = parenting wave 3 youth (male, high- delinquency wave 4 crime areas)	Population: recruited from all 7th & 8th graders in public schools, Rochester, NY; over- controls wave 2 sampled high-risk delinquency wave 3 youth (male, high- delinquency wave 4 crime areas)	838	8th–9th gr > 9th–10th gr $M's = 14 >$ 15 yrs	75% sampled T1	N/R	N/R% AYA N/R% Cauc N/R% Hip	Parental supervision was associated with lower delinquency at time 1 & change in delinquency between times 1 & 2. Delinquency at time 1 was associated with reduced change in perceived supervision between times 1 & 2. The model included affective bias at times 1 & 2.	$\chi^2 = 260.67, df = 113, p < .001$, CFI = .972 $\beta = N/R$ parent supervision T1—delinquency T2 $\beta = -.16$ delinquency T1—parent supervision T2 $\beta = -.36$ parent supervision T1—delinquency T1 $\beta = -.10$ parent supervision T2—delinquency T2 (all $p's < .05$ unless noted) (see "Validation" section for affective bias results) (multivariate structural equation model)
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Family Characteristics—Engagement/Disengagement

Ages 7–13

Authors	Year Design	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Patterson & Younger	1995 Prospective longitudinal 4 yrs	206	10–11 > 14 yrs	100%	Low Mdn = \$15k 33% unemployed	99% Cau 1% N/R	Poor parental monitoring predicted early arrest (ages 10–14). Monitoring did not predict early arrest when antisocial behavior, SES, parent transitions, discipline, unsupervised time, & deviant peers were taken into account.	Parental Monitoring & Early Arrest, Ages 10–14 Univariate $\beta = -.64, p < .01$ Multivariate $\beta = -.05, p = ns$ $\beta = 1.50, p < .001$ antisocial behavior $\beta = 0.48, p < .05$ parental transitions (logistic regression analysis)

Ages 14–19

Adams	1995 Prospective longitudinal 2 yrs	435 pairs	9th–10th or 11th–12th gr	43%	Low-middle Mdn = \$37k–\$61k 13% < 12 yr 42% < 12 yr 17% < 16 yrs 28% > 16 yrs multicultural	< 2% Afr < 2% Asp 94% Cau < 2% Hisp T1	According to high school youths' self-reports, delinquency at time 1 predicted lower attachment to mother & father 1 yr later (time 2), & attachment to mother at time 2 was associated with less delinquency the following year (time 3). Parental monitoring at time 2 was associated with reduced exposure to delinquent peers at time 3.	$\chi^2(60) = 50.91, p = .792$; AGFI = .987 $\beta = -.135$ attachment mom T2–delinquent T1–T3 $\beta = -.137$ delinquency T1–attachment mom T2 $\beta = -.197$ delinquency T1–attachment dad T2 $\beta = -.185$ parent monitoring T2–del peers T1–T3 (all p 's < .05) (covariance structure model)
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Barnes, Farrell, & Berneise

1994 Prospective longitudinal 1 yr	658	13–16 > 14–17 yrs	45%	Low-middle M = \$21k African-Am M = \$37.5k Caucasian	30% Afr 70% Cau	Adolescents' reports of parental monitoring, mother support, & positive communication with mother were associated with fewer deviant behaviors 1 yr later, after accounting for race, gender, age, parents' substance abuse, family structure, mother's education, family income, youth religion, & religiosity.	Parental Monitoring $F = 58.7, p < .001$ Mother Support $F = 33.3, p < .001$ Positive Communication $F = 15.1, p < .001$ (controls: race, gender, age, parents' substance abuse, family structure, mother's education, family income, youth religion, & religiosity; (MANCOVA, means not reported in paper)
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Simons, Johnson, et al.

1998 Prospective longitudinal 2 yrs	179	7th > 9th gr M = 12.5 yrs T1	100%	Low-upper M = \$25,642 (\$0k–\$135k) M = 13.5 yrs (8–20 yrs) parents' ed	100% Cau	Youths' reports of quality parenting (low hostility & harsh discipline, high monitoring & consistency) mediated the relationship between observed & parent-reported oppositional/defiant behavior in late childhood & self-reports of delinquency in early adolescence. High-quality parenting led to a relative decline in problem behavior over time, taking into account deviant peers.	$\chi^2(22) = 38.96$, GFI = .962, AGFI = .905 $\beta = -.21$ opp/def behavior T1–quality parenting T2 $\beta = -.22$ behavior T1–school commitment T2 $\beta = .20, p = .06$ behavior T1–deviant peers T2 $\beta = -.21$ quality parenting T2–delinquency T3 $\beta = -.21$ school commitment T2–delinquency T3 $\beta = .42$ deviant peers T2–delinquency T3 $\beta = -.10, p = ns$ behavior T1–delinquency T3 ($p < .05$ unless otherwise noted) (structural equation modeling)
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Family Characteristics—Engagement/Disengagement

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Forehand, Miller, et al.	1997 Concurrent correlational	Convenience: 4 samples of adolescents & their mothers recruited from public high schools, Bronx, NY, (2), Montgomery, AL, & San Juan, PR; adolescents & mothers resided in area for past 10 yrs or more	907	14-16 yrs	43%	Low $M = \$12-524k$	47% Afri. 53% Hisp 91% Afri. 7% W Ind, 2% Other 89% Public 6% Dornen 5% Other	Parental monitoring (combined parent & child ratings) & being male were associated with higher levels of self-reported delinquency in four samples: African-American adolescents, Montgomery, AL, & Bronx, NY; & Hispanic adolescents, San Juan, PR, & The Bronx, NY. Older age was related to more delinquency for NY youth. Other variables included parental communication, maternal age, education, marital status, residence in city, income, & parenting by age, gender interactions. Ethnic/geographical differences were found for parenting, delinquency, & all of the demographic control variables. Hispanic families from San Juan had the highest levels of parental monitoring & the lowest levels of self-reported delinquency.	African-American, Montgomery, AL $\beta = .35$, unique $R^2 = .12$ gender $\beta = -.31$, unique $R^2 = .07$ parent monitoring African-American, Bronx, NY $\beta = .17$, unique $R^2 = .03$ adolescent age $\beta = .23$, unique $R^2 = .04$ gender $\beta = -.31$, unique $R^2 = .08$ parent monitoring Hispanic, San Juan, PR $\beta = .40$, unique $R^2 = .16$ gender $\beta = -.31$, unique $R^2 = .06$ parent monitoring Hispanic, Bronx, NY $\beta = .33$, unique $R^2 = .11$ adolescent age $\beta = .20$, unique $R^2 = .04$ gender $\beta = -.29$, unique $R^2 = .06$ parent monitoring (see study for list of variables & interactions) (hierarchical multiple regressions, $p < .01$) Ethnic Group Differences Parent monitoring $M's = 27.4^a, 26.4^b, 25.5^c, 24.9^d$ Child delinquency $M's = 1.14^a, 1.84^b, 1.69^c, 1.70^d$ (order of $M's$: Hisp, San Juan & Bronx; African-Am, AL & Bronx; $M's$ with different letters differ $p < .05$) (ANOVA, Student Newman-Keuls, chi-square)
Fridrich & Flannery	1995 Concurrent group comparisons, correlational	Convenience: recruited from all 7th & 8th graders in 3 schools, 1 school district, midsize Southwestern city; no ESL classes; 81% participation rate	1,021	7th & 8th gr $M = 12.7$ yrs	52%	Low-middle from census track data: $M = \$32,272$ (\$17k-\$48.6k)	63% Cau 24% Hisp 13% N/R (Mexican-Am)	Parental monitoring had a direct negative effect on delinquency for Caucasian youth. Susceptibility to antisocial peer pressure mediated the relationship between youths' reports of parental monitoring & delinquency for Caucasian & Mexican-American youths. Mexican-American youths reported greater susceptibility to antisocial peer pressure & more delinquency than Caucasian youths; reports of parental monitoring did not differ. When acculturation* was examined, parental monitoring was higher for recent immigrants than for acculturated Mexican-American youths. Only acculturated Mexican-American youths reported more delinquency than Caucasian youths. *Acculturated: parents born in U.S., speak English; Unacculturated by Choice: parents born in U.S., speak Spanish; Unacculturated Recent Immigrant: parents born in Mexico, speak Spanish	Caucasian $R^2 = .50$ $\beta = -.28$ parental monitoring—delinquency $\beta = -.47$ parental monitoring—susceptibility ASPP $\beta = .53$ susceptibility ASPP—delinquency Mexican-American, Acculturated $R^2 = .66$ $\beta = -.59$ parental monitoring—susceptibility ASPP $\beta = .68$ susceptibility ASPP—delinquency Mexican-American, Unacculturated by Choice $R^2 = .60$ $\beta = -.35$ parental monitoring—susceptibility ASPP $\beta = .67$ susceptibility ASPP—delinquency Mexican-American, Unacc. Recent Immigrant $R^2 = .37$ $\beta = -.38$ parental monitoring—susceptibility ASPP $\beta = .59$ susceptibility ASPP—delinquency (all $p's < .01$; $p's = ns$: Hisp, parent monitoring—delin (2-step forced-entry multiple regression) Ethnic Group & Delinquent Activities t (978) = 2.53, $p < .01$; $M's = 4.5$ Mex-Am, 3.8 Cau Ethnic Group & Antisocial Peer Pressure t (993) = 2.02, $p < .05$; $M's = 10.9$ Mex-Am, 10.2 Cau Acculturation Group & Parental Monitoring F (3, 965) = 3.14, $p < .05$; $M's = 15.3$ acc, 17.2 imm Acculturation Group & Delinquency F (3, 966) = 6.83, $p < .05$ $M's = 6.7$ acc > 4.5 unacc, 3.8 Cau, 3.6 imm (t tests, ANOVA, Tukey's post hoc comparison)

Family Characteristics—Engagement/Disengagement Treatment & Preventative Interventions

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Race	Key Statistics
Oles, Henderson, et al.	1998 random assignment	Convenience: recruited pregnant women from free clinics & private obstetricians, semi-rural, part of upstate NY	315	15 yrs Born > 15 yrs	52% 72	Low-middle 59% low 71 65% low 72 M = 11.3 yrs maternal ed	88% Caucasian 12% N/R 72	Adolescents whose mothers received prenatal or pre- & postnatal nurse visits at home in addition to prenatal & well-child care had fewer arrests & convictions/probation violations than adolescents whose mothers were in the comparison group (prenatal & well-child care without nurse visits). Intervention effects were found for a subsample of low SES, unmarried mothers as well. Intervention groups did not differ on parent, child, or teacher reports of adolescents' behavior problems. The intervention targeted parental engagement, validation, & problem solving.	Total Sample, Arrests $p = .005$ tx preg & tx infant $M = .36$ ctrl, .16 tx preg, .17 tx infant Total Sample, Convictions $p < .001$ tx preg & tx infant $M = .27$ ctrl, .06 tx preg, .10 tx infant High Risk, Low SES & Unmarried, Arrests $p = .02$ tx preg, .03 tx infant $M = .45$ ctrl, .15 tx preg, .20 tx infant High Risk, Low SES & Unmarried, Convictions $p < .001$ tx preg & tx infant $M = .47$ ctrl, .07 tx preg, .09 tx infant (all models adjusted for child's gender, maternal age, ed, SES, work, marital status, support from significant other, & paternal public assistance) tx preg = nurse visit during pregnancy tx infant = nurse visit during pregnancy & infancy (statistics not reported)
Shieber & Johnson	1994 Intervention random assignment 2-mth followup	Source specific: recruited mothers of children with difficult temperaments who were having difficulties with parenting; recruited mothers by (1) flyers in preschools (selected for proximity & range of SES) & (2) ads in local publications; screened out for stress reaction, psychopathology, mother or child requiring treatment	40	3-5 yrs	60%	Middle $M = \$41k$ $M = 10$ yrs maternal ed	N/A Caucasian	Mothers of temperamentally difficult children who attended a temperament-focused parenting training group reported fewer child behavior problems & greater attachment to their children at post-treatment & 2-mth followup compared to wait-list controls.	Externalizing, Maternal Report $F(1, 35) = 9.33, p < .01$ post-treatment $F(1, 32) = 8.52, p < .01$ followup (N) $M = 66.5$ pre, 58.2 post, 56.5 fu parent training $M = 63.4$ pre, 63.1 post, 61.3 fu wait list control Child Behavior Problems, Maternal Report $F(1, 28) = 6.86, p < .01$ post-treatment $F(1, 28) = 7.64, p < .01$ followup $M = 11.9$ pre, 8.3 post, 8.8 fu parent training $M = 11.8$ pre, 10.8 post, 11.1 fu wait list control Attachment to Child, Maternal Report $F(1, 34) = 4.79, p < .05$ post-treatment $F(1, 30) = 12.28, p < .01$ followup $M = 15.3$ pre, 13.6 post, 13.3 fu parent training $M = 15.2$ pre, 15.3 post, 15.9 fu wait list control (Univariate Fs, controlling for pretest scores)
van Ijzendoorn, Juffer, & Duyvesteyn	1995 Meta-analysis Interventions 11 mothers' sensitivity 12 children's attachment	Source specific: samples include firstborn, adopted 1st child, large & small network, anxious low SES, & firstborn, low SES, & firstborn, low SES, & firstborn, recent immigrant/ insecure child	869 n's = 18 mths > 5 mths-2 yrs 12-154	Prenatal-18 mths > 5 mths-2 yrs	N/R	Low-middle $n = 8$, low $n = 1$, mid $n = 3$, N/R	1 African & 100 Caucasian 3 Dutch 1 Hispanic 7 N/R *1 infant Korean 1 infant Sri Lankan **Central Am, Mex	Interventions aimed at changing parental sensitivity to infants were moderately successful while interventions aimed at changing children's attachment insecurity had small effects.	Parental Sensitivity Effect size $d = .58, p = n/r$, range = -.01 - 2.62 Children's Attachment Effect size $d = .17, p = .038$, range = -.42 - .97 (Cohen's d)

Webster-Stratton (1998) & Webster-Stratton, Kolpacoff, & Hollinsworth (1988): see "Validation, Treatment & Preventative Interventions"
Bank et al. (1991), Bordin et al. (1993), Chamberlain & Reid (1998), Patterson et al. (1982), Tremblay et al. (1991), and Wahler et al. (1993): see "Discipline and Conflict, Treatment & Preventative Interventions"

Family Characteristics-Engagement/Disengagement

Treatment & Preventative Interventions

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Wendlandt, Caro, Picotini, & Hiller	1999 Intervention random assignment	Convenience: volunteer mothers & their newborns, Porto Alegre, Brazil	36	2-3 days > 1 mth	44%	Low M = 7.4 yrs maternal ed semi- & unskilled paternal occ.	100% Brazil	Mothers of newborns who took part in an intervention designed to increase sensitivity showed greater responsiveness to infant vocalizing & looking at mother & less unresponsiveness to infant cries, vocalizations, & involuntary behaviors during home observations at 1 mth of age, compared to mothers in the control group who had received basic caregiving instructions. Maternal education, paternal occupation, & infant birth weight were controlled.	Wilcoxon $\chi^2 = 3.56$, (synchronous-asynch scores) $F(2, 30) = 27.08$, $p < .01$ Infant vocalizes, mother vocalizes $F(1, 31) = 19.15$, $p < .001$ $M's = 11.47$ vs. 4.74 ctrl free-play $M's = 13.23$ vs. 6.00 ctrl babbling Infant vocalizes, mother unresponsive $F(1, 31) = 3.98$, $p < .05$ group $\times$ situation $F(1, 31) = 14.64$, $p < .001$ group $M's = .35$ vs. 2.37 ctrl free-play $M's = 1.70$ vs. 4.53 ctrl babbling (see study for additional significant effects) ($p's = ns$, covariates: maternal education, paternal occupation, & infant birth weight) (ANCOVAs, Tukey test when needed)

Validation/Invalidation-Ages 0-3

Belsky, Hsieh, & Crnic	1988 Prospective longitudinal 27 mths	Convenience: recruited from birth announcements, semi-rural university town, central PA, firstborn son from intact families	125	10 mths > 37 mths	100%	Low-upper M = \$40k (\$34-\$100k)	100% Caucasian	Observed negative mothering (intrusiveness & negative affect) during the 2nd & 3rd yrs of life predicted age 3 parent reports of externalizing problems for highly negative infant boys. Positive mothering was not related to externalizing.	Negative Mothering, 2nd Year $R^2 = .07$, $\Delta R^2 = .07$, $\Delta F = 4.45$, $p < .05$ $p = -.07$, $p = ns$ Negative Mothering, 3rd Year $R^2 = .16$, $\Delta R^2 = .08$, $\Delta F = 5.46$, $p < .05$ $p = -.40$, $p < .05$ ($p's = ns$; positive mothering) (regression)
Benken, Egeland, et al.	1989 Prospective longitudinal 7 yrs	Convenience: recruited high-risk mothers residing prenatal care at public health clinic, MI, 1977-1979	191	12 mths > 7-8 yrs	55%	Low 41% < 12 yrs maternal ed	N/R	Maternal hostility & physical abuse at 42 mths predicted teacher ratings of aggression in grades 1-3, after accounting for avoidant attachment with negative affect & life stress.	Aggression, Teacher Ratings, Boys $R^2 = .33$, $F(9, 65) = 3.62$ Developmental history set (attachment & affect) $R^2 = .17$, $F(4, 91) = 4.69$, $p < .01$ Maternal hostility set $R^2 = .19$, $\Delta F = .02$, $F(2, 97) = 11.73$, $p < .01$ Life stress set $R^2 = .16$, $\Delta F = ns$, $F(3, 74) = 5.28$, $p < .01$ Aggression, Teacher Ratings, Girls $R^2 = .25$, $F(9, 54) = 2.05$, $p < .05$ Developmental history set (attachment & affect) $R^2 = .08$, $F(4, 70) = 1.60$, $p = .18$ Maternal hostility set $R^2 = .11$, $\Delta F = .04$, $F(2, 77) = 4.83$, $p < .01$ Life stress set $R^2 = .17$, $\Delta F = ns$, $F(3, 66) = 3.01$, $p < .03$ attachment = avoidant, affect = negative effect (multiple regressions with sets)

Family Characteristics—Validation/Invalidation

Ages 0-3									
Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Shaw, Winslow, et al.	1998 Prospective longitudinal 2.5 yrs	Convenience: high-risk mothers in WIC Nutritional Supplement Program, metro area of Pittsburgh, PA, cohort 2	103	12 mths > 3.5 yrs	59%	Low $M = \$3.132$ $M = 30$ Hollingshead	39% AfrA < 4% AsaA 57% CauC < 4% Hisp	For boys, age 1 high maternal responsiveness & age 2 maternal rejection predicted age 3.5 mother reports of child externalizing. For boys, age 2 maternal rejection & child noncompliance predicted mother-rated externalizing at 3.5 yrs, accounting for age 2 externalizing. For girls, the interaction of maternal rejection & child noncompliance predicted mother-rated externalizing at 3.5 yrs, accounting for age 2 externalizing.	Externalizing Age 3.5, Boys, Mother Report Overall $F(7, 76) = 3.57, p < .003$ $R^2 = .25, \Delta R^2 = .06, \beta = -.90$ $F = -2.54, \Delta F = p < .01$ Men = 59 high response, high rejection, boy Men = 44 high response, low rejection, boy Externalizing Age 3.5, Girls, Mother Report Overall $F(8, 82) = 15.86, p < .001$ $R^2 = .62, \Delta R^2 = .03, \beta = 1.33$ $F = 2.78, \Delta F = p < .007$ Men = 37.5 high noncomp, hi rejection, boy Men = 45 low noncomp, hi rejection, boy Men = 52 high noncomp, hi rejection, girl Men = 45 low noncomp, low rejection, girl (hierarchical multiple regressions)
Ages 4-6									
Campbell, Breaux, et al.	1986 Prospective longitudinal 3 yrs	Source specific/ convenience: recruited parents of children with behavior problems & nonsymptomatic controls from doctor's offices & child groups	51-63	$M = 36 >$ $M = 48 >$ $M = 73 >$ mths	60% T1	Low-upper middle $M = 50.8$ Hollingshead	N/R	Negative & directive maternal behavior at age 3 showed increasing correlation with maternal ratings of child aggression at ages 3, 4, & 6 after controlling for SES, family stress, & number of siblings.	Child Aggression Predicted by Maternal Behavior Age 3 ($n = 63$) $R = .55, \Delta R^2 = .06, F = 5.02, p < .05$ Age 4 ($n = 51$) $R = .58, \Delta R^2 = .14, F = 9.61, p < .05$ Age 6 ($n = 52$) $R = .46, \Delta R^2 = .16, F = 9.79, p < .05$ (order of variable entry: SES, family stress, # of siblings, maternal behavior) (hierarchical multiple regressions)
Ages 7-13									
Stocker	1993 Concurrent correlational data collected over 3 yrs, T1 not used to predict T2	Convenience: nonclinical sample of families from the Colorado Adoption Project; sampling method not reported	64 sib pairs	$M = 4.5 >$ 8.1 yrs younger sibs $M = 7.8 >$ 10.9 yrs older sibs	N/R	N/R	N/R	Positive maternal affection was associated with less externalizing for both older & younger siblings according to mother reports. Younger siblings who had less positive affection from their mothers at the same or different age as their older siblings had higher levels of externalizing.	Externalizing & Positive Maternal Affection Older sibling $r = -.32, p < .05$ Younger sibling $r = -.41, p < .05$ Externalizing & Differential Maternal Behavior Younger sibling, different age $r = .41, p < .05$ Younger sibling, same age $r = .42, p < .05$ (correlations)
Conger, Ge, et al.	1994 Prospective longitudinal 1 yr	Population: recruited from all 7th graders in all public & private schools in all towns $\leq \$6,500$, 8 adjacent rural counties, Iowa, 1991; region had experienced economic decline	378	$M = 12.6$ yrs	48%	Low middle- middle $M = \$33.8k$ 11% under poverty line	100% CauC	Maternal & paternal hostility toward the adolescent mediated the relationship between parent-adolescent financial conflict & adolescent externalizing for boys & girls.	Mother Model $\chi^2(138) = 261.5, GFI = .932$ $R^2 = .55$ parent hostility—externalizing $R^2 = .46$ financial conflict—parent hostility Father Model $\chi^2(138) = 227.6, GFI = .941$ $R^2 = .35$ parent hostility—externalizing $R^2 = .45$ financial conflict—parent hostility (p's < .05; p's = ns: financial conflict—externalizing) (structural equation models)

Family Characteristics—Validation/Invalidation

Ages 7–13

Year Design
1997 Prospective longitudinal
1.5 yrs
3 waves

Authors
Jang & Smith

Representativeness
Population:
recruited from all
7th & 8th graders
in public schools
Rochester, NY; over-
sampled high-risk
youth (male, high
crime areas)

Size
838

Age
6th–9th or
9th–12th or
14–15 yrs
M = 14
15 yrs

% Male
75%
sampled
T1

SES
N/R

Ethnicity
N/A
N/A
N/A
N/A

Result
Child-reported affective ties to
parents in 7th/8th grade were not
associated with child-reported
changes in delinquency in 9th/10th
grade; however, delinquency in 7th/
8th grade predicted lower affective
ties in 9th/10th grade. Affective ties
& delinquency were not related
concurrently at T1 or T2. This model
included parental supervision T1 & T2.

Key Statistics
 $\chi^2 = 250.67$, $df = 113$, $p < .001$, $GFI = .972$
 $r = .14$ affective ties T1–delinquency T2
 $r = -.17$, $p < .05$ delinquent T1–delinquency T2
 $r = .32$, $p < .05$ affective ties T1–delinquency T1
 $r = -.03$, $p = ns$ affective ties T2–delinquency T2
(see “Engagement” section for supervision results)
(multivariate structural equation model)

Year Design
1998 Prospective
longitudinal
6 mths

Authors
Meeher, Biglan, et al.

Representativeness
Convenience/
source specific:
students randomly
sampled &/or mailed
by teachers as at risk;
public schools in 2 small
Pacific NW communities

Size
174

Age
5th–7th or

% Male
53%

SES
Low-middle
21% < 12 yrs
36% = 12 yrs
37% < 16 yrs
12% = 16 yrs
5% > 16 yrs
parents’ ad

Ethnicity
2% AFA
6% N/A
74% C
2% Hsp
8% Mld
8% N/R

Result
Positive family relations & positive
reinforcement by parents (latent
variables based on 3 child reports,
6 mths apart) were associated
with lower antisocial behavior at
wave 3.

Positive Family Relations & Antisocial Behavior
 $r = -.67$, $p < .05$
(“trust, warmth, fun, togetherness”)
Positive Reinforcement & Antisocial Behavior
 $r = -.33$, $p < .05$
(latent variable structural equation models)

Year Design
1994 Prospective
longitudinal
2 yrs

Authors
Conger & Conger

Representativeness
Population:
recruited from all
7th grade students,
34 public & private
schools, communities
≤ 6,500, 8 counties
in north central Iowa,
1980; all 2-parent
families

Size
359

Age
7th > 9th or
& sibling
within 4 yrs
M = 15 yrs
older sibling
M = 10.5 yrs
younger sibling
also 9.4–18 yrs

% Male
48%
T1
11% < poverty

SES
Low-middle
Adm = \$33k
M = 13 yrs
parents’ ad
11% < poverty

Ethnicity
100% C

Result
The sibling treated with the most
hostility by the mother or father
reported the greatest increase in
delinquency from early to
mid-adolescence.

Father’s ($S, N = 359$) = 11.92, $AGFI = .554$
 $\chi^2 = 15$, $r = 2.01$ hostility T1 > delinquency T2
 $\chi^2 = .06$, $r = 0.72$ delinquency T1 > hostility T2
 $\chi^2 = .32$, $p < .05$ hostility T1 > delinquency T1
Mother’s ($S, N = 359$) = 6.59, $AGFI = .975$
 $\chi^2 = .16$, $r = 2.37$ hostility T1 > delinquency T2
 $\chi^2 = .14$, $r = 1.78$ delinquency T1 > hostility T2
 $\chi^2 = .26$, $p < .05$ hostility T1 > delinquency T1
(p ’s = ns, hostility T2 > delinquency T2)
hostility = differential mother/father hostility
delinquency = differences in sibling delinquency
(latent variable structural equation models)

Year Design
1994 Prospective
longitudinal
4 yrs

Authors
Feldman & Weinberger

Representativeness
Convenience:
6th grade boys &
their families were
recruited from 2
school districts,
San Francisco, CA,
area

Size
81

Age
6th > 10th or

% Male
100%

SES
Middle
70% > 12 yrs
parental ed
M = 1.7
1.4–7 low
Hollingshead

Ethnicity
5% AFA
12% AFA
69% C
8% Hsp
8% Mld
5% Other

Result
Parent/child reports of effective
parenting (consistent, nonaversive,
nonrejecting) & observations/
reports of positive family functioning
in 6th grade were associated with
lower parent/child reports of
delinquency in 10th grade. In
mediational analyses, effective
parenting & father’s family
functioning indirectly influence
delinquency through boys’
positive self-restraint. For mother’s
parenting, positive family functioning
exerted a direct negative influence
on delinquency.

Parenting, Family Functioning, & Delinquency
 $r = -.22$, $p < .05$ effective parenting 6th, delinq 10th
 $r = -.37$, $p < .01$ family functioning 6th, delinq 10th
Father Parenting Model
 $\chi^2 = .55$, $p < .001$ effective parent T1–restraint T1
 $\chi^2 = .37$, $p < .05$ restraint T1–restraint T2
 $\chi^2 = .39$, $p < .05$ restraint T2–delinquency T2
 $\chi^2 = .32$, $p < .05$ family function T1–restraint T2
 $\chi^2 = .39$, $p < .01$ restraint T2–delinquency T2
Mother Parenting Model
 $\chi^2 = .40$, $p < .01$ effective parent T1–restraint T1
 $\chi^2 = .32$, $p < .05$ restraint T1–restraint T2
 $\chi^2 = .34$, $p < .05$ restraint T2–delinquency T2
 $\chi^2 = .31$, $p < .05$ family functioning T1–del T2
(p ’s = ns: parent T1–del T2, father model family T1–del T2)
(path analysis, least squares regression analyses)

Family Characteristics—Validation/Invalidation Ages 14–19

Authors: Scaramella, Conger, & Simons

Year Design: 1999 Prospective longitudinal 5 yrs

Size: 319

Representativeness: Population: recruited from all 7th-grade students in 34 public & private schools in communities 46,500, 8 counties in north central Iowa, 1989, 2-parent families

Age: 7th–8th > 8th–12th gr

% Male: 47%

SES: Low–upper: $M = \$33.7k$
 Min = \$13 yrs
 parents ed

Result: Adolescents whose parents were above the median on warmth & low hostility reported lower levels of externalizing each year from 8th to 12th grades & lower rates of growth in externalizing over this time than adolescents of parents below the median.

Key Statistics:

Main Effects:
 $\eta^2 = 3\%$, $F(1, 12) = 8.56$, $p < .01$, parent warmth
 $\eta^2 = 4\%$, $F(1, 12) = 13.55$, $p < .001$ low hostility

Repeated Measures:
 Parental warmth $F(3, 12) = 2.97$, $p < .05$
 Linear = $F(1, 12) = 5.96$, $p < .01$
 Low hostility $F(3, 12) = 2.16$, $p < .10$
 Linear = $F(1, 12) = 3.83$, $p < .01$

Sample MS—Parent Low Hostility, Girls, 8th–12th, 12th
 above M s = .95, 1.63, 2.96, 4.82, grades
 below M s = 2.18, 3.39, 5.03, 8.25 grades
 (repeated measures ANOVAs, effect size, eta-square)

Ethnic Minority Populations

Authors: Brody, Stremm, & Flor

Year Design: 1996 Concurrent correlational

Size: 90

Convenience: 2-parent families with firstborn children ages 9–12 were recruited from schools, churches, & community contacts in rural population under 2,500 GA & SC

Age: 9–12 yrs

% Male: 47%

SES: Low–middle: $M = \$29,053$
 (\$2.5k – \$57.5k)
 19% < poverty

Result: Observed family cohesion had an indirect negative effect on mother & teacher ratings of externalizing, through higher youth self-regulation, after taking into account per capita income & parental religiosity.

Key Statistics:

Family Cohesion & Externalizing
 $H^* = 59$, RMS Cov (E, U) = .08
 $R^2 = 50$, $F(5, 87) = 17.21$, $p < .01$ maternal model
 $R^2 = 47$, $F(5, 87) = 15.25$, $p < .01$ paternal model
 $\beta = .27$ family cohesion—self-regulation
 $\beta = -.26$ interpersonal conflict—self-regulation
 $\beta = -.65$ self-regulation—externalizing
 $\beta = -.23$ (mat) $-.15$ (pat) religiosity—externalizing
 (latent variable path analysis)

Authors: Hamish, Dodge, & Valente

Year Design: 1995 Concurrent correlational

Size: 376

Convenience: selected kindergarten children & their parents from schools with high at-risk populations; no father-only households; representative of schools' distribution on race, gender, behavior problems; Durham, NC, Nashville, TN, central PA, & Seattle, WA

Age: K–1st gr
 $M = 6.5$ yrs
 in gr 1

% Male: 51%

SES: Low–upper: 3.7% 1
 16.1% 2
 19.5% 3
 28.5% 4
 32.2% 5
 1st–5 low
 hellingshead

Result: The relationship between maternal depressive symptoms & teacher ratings of externalizing was partially mediated by the quality of mother-child interactions (observed) for Caucasian, but not for African-American, families. For both groups, a positive/warm mother-child relationship was associated with lower externalizing scores. For African-American mothers, level of maternal depressive symptoms did not affect the quality of the mother-child interaction, as it did for Caucasian mothers. For all families, mother-child interaction quality mediated the relationship between SES & child externalizing.

Key Statistics:

Mother-Child Interactions, Mat Dep, Child Behavior
 $\chi^2(12) = 31.92$, $p < .01$, AGFI = .95 model 1a
 $\beta = .30$ mat dep & child behavior problem
 $\beta = -.24$ mat dep & mother-child interaction
 $\beta = -.26$ m-c interact & child behavior problem
 total effect .37 mat depression on child behavior
 $\chi^2(4) = 12.10$, $p < .05$, AGFI = .96 model 2a
 $\beta = -.30$ SES & child behavior problem
 $\beta = .39$ SES & mother-child interaction
 $\beta = -.22$ m-c interaction & child behavior problem
 total effect = $-.39$ SES on child behavior problem
 (latent variable structural equation analyses)

Ethnic Group Differences
 Maternal depression & mother-child interactions
 $\chi^2(11) = 6.80$, $p < .01$
 $r(164) = -.05$, $p = ns$ African American
 $r(188) = -.31$, $p < .01$ Caucasian
 (DT-square, bivariate correlations)

Family Characteristics—Validation/Invalidation

Treatment & Preventative Interventions				Key Statistics			
Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity
McNeil, Eyberg, et al.	1991 Intervention not random	Source specific: to group referred for behavior problems at home & school, 1 child with behavior problems, not treated, & 1 child with average behavior picked from behavior classroom for deviant & normal control groups	27	30-66 mths	77% (100% to grp)	Low-middle M = \$21.4K Mdn = \$12K to grp	20% Afr 77% Cau 3% Hisp
Webster-Stratton	1998 Intervention random assignment 1 yr followup	Source specific: recruited families entering Head Start, 9 centers in 1 urban district; 2 cohorts (fall 1993 & 1994; Seattle, WA)	296 f-up 394 post-tx	M = 56.5 mths	53%	Low M = \$10K	17% Afr 4% Asn 63% Cau 6% His 4% NatA (pre-tx)
Webster-Stratton, Kolpacoff, & Hollinsworth	1988 Intervention random assignment 1) TM: indiv. videotape modeling 2) GDM: group discussion & VM 3) GD: group discussion 4) wait list control	Source specific: families of children with primary problem of misconduct, self- or professionally referred for treatment	114	M = 4.5 yrs (3-8 yrs)	69%	Low-upper 12% 1 21% 2 29% 3 23% 4 15% 5 Hollingshead	N/R
				Problem Behavior, Classroom, Teacher Report $F(1, 15) = 5.03, p < .05$ (pre-, post-IV) $M's = 20, 10$ to 13, 10 deviant ctrl; 0.67, 1.1 ctrl % Compliance, Classroom, Observed $F(1, 15) = 4.59, p < .05$ $M's = 54, 87$ to 64, 75 deviant ctrl; 73, 80 ctrl Home, Treatment Group ($n = 10$) Problem behavior, mother report $F = 5.03, p < .01, M's = 23.3$ pre-, 6.1 post-tx % compliance, observed $F = 7.59, p < .01, M's = 40.7$ pre-, 70.4 post-tx (ANOVA, Duncan's MST on difference scores, t tests) Mother, Harsh or Critical Style, Observed $F = 7.85, p < .01$ (pre-post) $M's = 1.49, 1.29$ IV; 1.40, 1.37 control $F = 4.17, p < .05$ (pre-followup) $M's = 1.52, 1.30$ IV; 1.38, 1.33 control Mother, Positive Affect, Prose, Observed $F = 7.72, p < .001$ (pre-post) $M's = 22.1, 31.96$ IV; 23.6, 25.1 control $F = 4.92, p < .01$ (pre-followup) $M's = 21.6, 28.5$ IV; 23, 25.5 control Child, Deviance & Noncompliance, Observed $F = 11.69, p < .01$ (pre-post) $M's = 14.5, 8.99$ IV; 9.75, 9.43 control $F = 3.67, p < .05$ (pre-followup) $M's = 14.25, 9.84$ IV; 9.66, 7.24 control Child, Misbehavior & Negative Affect, Observed $F = 8.16, p < .01$ (pre-post) $F = 4.12, p < .05$ (pre-followup) $M's = 1.50, 1.35, 1.36$ IV; 1.33, 1.34, 1.25 control (*pre test $M's$ effect smaller followup sample) (9's < .05 - .001, MANOVA, ANOVA, t's for ts) Externalizing, Mother Report $F's = 4.05$ IVM & 4.27 GDM (vs. ctrl), $p's < .001$ $F = 2.21, p < .05$ GD vs. Ctl (pre-, post-IV) $M's = 61.1, 37.96$ IVM; 53.20, 31.07 GDM $M's = 48.5, 34.30$ GD; 53.77, 46.48 control Father Criticisms, Observed $F's = 2.75$ IVM, 2.65 GDM (vs. ctrl), $p's < .01$ $F = 2.37, p < .05$ GD vs. ctrl (pre-, post-IV) $M's = 13.30, 7.18$ IVM; 19.75, 8.70 GDM $M's = 15.96, 8.14$ GD; 11.0, 12.07 control (see study for other significant results) (MANOVA, ANOVA)			
				Children who participated in a 14-week parent-child interaction intervention (no direct classroom intervention) had fewer teacher-reported behavior problems & more observed compliance to teacher requests than did deviant & normal classroom controls, accounting for level of pre-tx problem behaviors. Treated children also showed improved behavior at home according to observations & mother reports. Families who attended a parent-training intervention in addition to Head Start showed greater improvements in maternal parenting & child behavior than families in Head Start alone. During home observations, intervention group mothers were less negative, harsh, & critical, & displayed more positive affect than control mothers, while intervention group children had a greater reduction of problem behaviors, negativity, & noncompliance than control children. All improvements were maintained after 1 yr. Mother & teacher-reported child behavior problems did not differ across intervention groups. Each of the three treatment groups, IVM, GD, & GDM, showed improvements in mother & father parenting (observed) & child behavior (observed, mother & father reports) compared to wait list controls. The few outcome differences among treatment groups favored GDM treatment.			

Family Characteristics—Discipline and Conflict

Ages 0-3

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Crandenberg & Louie	1996 Prospective longitudinal concurrent 4 yrs correlational	Convenience: N/R	42	2 > 6 yrs	48%	Middle 64% mother: 69% fathers 16 yrs old	81% Cau 1% Hisp 11% Mixed	Age 6 externalizing (father report) & mothers (girls) reports of coercion. Child reports of manipulation. Behavior with peers at age 6 were predicted by age 2 observed negative maternal control for boys & less observed maternal guidance for girls.	Age 6 Externalizing, Father Report $r(12) = .68, p < .01$ paternal coercion, boys $r(22) = .57, p < .03$ maternal coercion, girls Age 6 Manipulative Behavior With Peers, Child Report $r(12) = .51, p < .03$ maternal control, boys $r(22) = -.47, p < .03$ maternal guidance, girls (zero-order correlations)

Fagot & Leve	1998 Prospective longitudinal 3.5 yrs	Convenience: from metro area of midsize OR city, sampling method N/R	122	18 > 60 mths	53% T1	Low-middle AOR's = \$15k T1 \$20k T2	2% AfrA 1% AsA 95% Cau 1% Hisp 1% PacIs	Parent cohesiveness at age 2 predicted teacher ratings of age 5 externalizing, taking into account family structure & negative child behavior in play group (observed), attachment, temperament, negative behavior at home, parent ratings of externalizing, gender, income, contact with police, & family agency use.	Externalizing, Age 5, Teacher Ratings Step 4: $R^2 = .39, \Delta R^2 = .13, F = 3.41, p < .0001$ $\beta = .26, p < .01$ parent coercion $\beta = .28, p < .05$ marital status $\beta = .21, p < .05$ child negative beln, play group (β 's = ns: sex, agency use, police contact, income, home behavior, temperament, attachment, external-parent rep) (stepwise hierarchical regression, step 1: gender, step 2: demographics, step 3: child, 4: observed coercive parenting)
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Ages 4-6

Cinabell	1994 Prospective longitudinal 2 yrs group comparisons	Convenience: recruited from 16 suburban preschools, teacher-rated ADD & matched (birthday) controls & parent referred from clinics, dr.'s offices, preschools	105	M's = 46 > 64 mths	100%	Low-upper middle M's = 48-55 Hollingshead	1% AfrA 1% AsA 98% Cau T1	Maternal negative control at time 1 was highest for boys with behavior problems (parent & new teacher ratings) that continued for 2 yrs after pre-school, followed by boys whose behavior problems did not continue, followed by controls.	Maternal Negative Control, Time 1 $F(2, 102) = 9.73, p < .001 (M = 105)$ $M = 1.30^*$ continuing problems ($n = 18$) $M = .08^*$ not continuing ($n = 47$) $M = -.117^*$ control group ($n = 40$) (M's with different subscripts differ $p < .05$) (ANOVA, statistical test not reported)
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Campbell, March, et al.	1991 Prospective longitudinal 1 yr	Convenience: recruited from 16 suburban preschools, teacher-rated ADD & matched (birthday) controls & parent referred from clinics, dr.'s offices, preschools	108	M = 42.8-47.5 mths > M = 59 mths	100%	Middle	1% AfrA 1% AsA 98% Cau	Negative maternal control predicted higher ratings of externalizing 1 yr later for boys referred by parents or recruited from preschools for problem behavior. For the parent-referred group, this relationship remained significant even after initial symptom level was taken into account.	Negative Maternal Control & Externalizing $r(24) = .63, p < .01$ parent referred $r(80) = .22, p < .05$ preschool recruits Externalizing, Parent Referred ($n = 35$) Step 2: $R = .76, F(4, 19) = 6.62, p = .002$ model $R = .70, \Delta R^2 = .20, \Delta F = 8.18, p < .01$ neg ctrl Externalizing, Preschool Recruited ($n = 80$) Step 2: $R = .499, F(3, 76) = 8.42, p = .002$ model $R = .47, \Delta R^2 = .01, \Delta F < 1, p = ns$ neg mat ctrl (Hierarchical multiple regressions, step 1: initial symptom level, step 2: negative mat control, step 3: depression)
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Campbell, Pierce, et al.	1996 Prospective longitudinal 5-6 yrs	Convenience: recruited from 16 suburban preschools, teacher-rated ADD & matched (birthday) controls & parent referred from clinics, dr.'s offices, preschools	104	4 > 9 yrs	100%	Middle M = 52 Hollingshead	1% AfrA 1% AsA 98% Cau	Observed negative maternal control at age 4 predicted externalizing at age 9. Predict maternal control at age 9. Negative maternal control & externalizing showed positive concurrent relationships as well.	Negative Maternal Control, Age 4; Externalizing, Age 9 $\beta = .25, p < .01$ negative control 4-externalizing 9 $\beta = .14, p = ns$ externalizing 4-negative control 9 $\beta = .41, p < .001$ negative control 4-externalizing 9 $\beta = .09, p = ns$ negative control 4-negative ctrl 9 $\beta = .21, p < .05$ negative control 9-externalizing 9 $\beta = .40, p < .001$ externalizing 4-externalizing 9 (cross-lagged regression)
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Family Characteristics—Discipline and Conflict

Age 4-6

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Kingston & Poir	1995 Prospective longitudinal 5 yrs group comparisons	Convenience source specific: sampled at ages 7-8 participants of the Australian Temperament Project; selected children with high scores on aggression, & random sample of nonaggressive children	175	2-3 yrs > 7-8 yrs	61%	N/R	N/R	Parental use of nonphysical discipline, parental control through guilt & anxiety, & hostile sibling interactions (parent reports) differentiated stable aggressive children (ages 2-3 & 7-8) from nonaggressive children, along with child's temperament at ages 2-3, 3-4, 5-6, & 7-8, & mother's overall perception of child at ages 2-3, 5-6, & 7-8.	$\chi^2(14) = 35.05, p < .001$ (84% F1, 14.2% F2) Nonphysical discipline $r = .41$ F1, $-.12$ F2 Parental control, guilt $r = .31$ F1, $-.10$ F2 $M = 3.50$ stable agg, 2.77 non agg Solving interaction, hostile $r = .56$ F1, $.27$ F2 $M = 4.31$ stable agg, 2.95 non agg Child temperament F1, F2 $r = .34, .35$ (2-3 yr); $.49, .40$ (3-4 yr); $.62, .25$ (5-6 yr); $.59, .20$ (7-8 yr) Mother perception F1, F2 $r = .47, .26$ (2-3 yr); $.62, -.26$ (5-6 yr); $.73, -.45$ (7-8 yr) F1 = function 1, F2 = function 2 (stepwise discriminant function analysis)

Schwartz, Dodge, et al.	1997 Prospective longitudinal 5 yrs	Convenience: parents recruited during pre-registration for kindergarten; Nashville, Knoxville, TN, & Bloomington, IN	520	K > 3rd, 4th gr	100%	Low-middle	21% AfrA 77% Cauc < 2% Other	Boys who were aggressive victims in middle childhood had experienced more restrictive controls in their home environments in early childhood than did passive victims, nonvictim aggressors, & normative controls.	Wilks's $\lambda = .61, F(27, 354) = 2.39, p < .001$ Restrictive discipline $F(3, 190) = 3.32, p < .05$ $M = 3.4$ aggressive victims $M = 2.8$ passive victims $M = 2.7$ nonvictim aggressors $M = 2.7$ controls (MANOVA, ANOVA, planned contrasts)
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Ages 7-13

Cohen & Brook	1995 Prospective longitudinal 10 yrs T1-1975 T2-1983 T3-1985	Population: recruited from random sample of children ages 1-10, in 100 randomly sampled neighborhoods, 2 counties, update NY; 46% of 1-5 yr olds at T1 completed T3	976 T1 732 T2 830 T3	1-10 > 11-20 yrs	50%	Low-upper $Mdn = 12$ yrs (6-12 yrs) maternal ed	5% AfrA 95% Cauc	Power-assertive parental punishment in early childhood predicted conduct disorder at ages 10-18 & 12-20 after controlling for early behavior problems, parent psychopathology, marital conflict, age, & SES. For children under 6 at T1, punishment & conduct disorder had a reciprocal relationship from early to late childhood, & unidirectional effect (punishment predicting conduct disorder) from late childhood to early adolescence. There were no cross-lagged effects for children older than 6 at T1.	Punishment & Conduct Disorder ages 10-18 $OR = 2.02, CI = 0.99-4.15$ ($n = 721$) (controls: age, gender, SES, early problems) Punishment & Conduct Disorder ages 12-20 ($n = 723$) $OR = 3.35, CI = 0.98 - 11.4$ boys $OR = 3.34, CI = 0.74 - 15.0$ girls (controls: early problems, age, SES, marital conflict, parent psychopathology) Younger Children (1-5 yrs at T1) $r = .19$ behavior problem T1—punish T2 $r = .10$ punish T1—behavior problem T2 $r = .13$ punish T2—behavior problem T3 $r = .25$ behavior problem T1—punish T1 $r = .29$ behavior problem T2—punish T2 ($p = ns$ behavior problem T3—punish T2 & T3) Older Children (6-10 yrs at time 1) $r = .43$ behavior problem T1—punish T1 $r = .27$ behavior problem T2—punish T2 ($p = ns$ bet T1 — punish T2, punish T1—bet T2) (cross-lagged correlations)
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Family Characteristics—Discipline and Conflict Ages 7–13

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Results	Key Statistics
Feilich, McGee, et al.	1991 Prospective longitudinal 6–8 yrs	Population: consecutive births, spring 1972–1973, Dunedin, New Zealand	849	7–9 yrs > 13 yrs	N/R	N/R	N/R% Cau 2% Maori/ Polyn	Parents' reports of early behavior problems were associated with inconsistent discipline, male gender, & poor maternal mental health, taking into account family adversity & parental strictness. Externalizing in adolescence was predicted by inconsistent & relaxed (lax or neutral) discipline, accounting for gender & early behavior problems.	Key Statistics Early Problem Behavior, Age 7–9 Predictors Adj OR = 3.0, $p < .001$ inconsistent discipline Adj OR = 1.3, $p < .05$ male Adj OR = 4.5, $p < .001$ poor mat mental health (controls: family adversity & strictness) Externalizing, Age 15 Predictors Adj OR = 2.3, $p < .05$ early behavior problems Adj OR = 2.1, $p < .05$ relaxed & inconsistent discipline (controlling for gender) (multivariate logistic regression analyses)
Patterson, Forgatch, et al.	1998 Prospective longitudinal 10 yrs	Population: recruited from 4th- grade boys in 11 randomly selected schools in neighbor- hoods with high delinquency rates, metro area of mid- size NW city.	206	9–10 > 18 yrs	100%	Low-middle Med = \$15k	N/R% Cau "majority"	Ineffective discipline (observed coercion, negative behavior, verbal and/or physical aggression) increased the risk of antisocial behavior, early arrest, & chronic offending, after accounting for parental monitoring, marital transitions, & social disadvantage.	Antisocial Behavior ($n = 103$) Exp $\beta = .46$, $p = -.76$, $p = .000$ effective discipline $\beta = -.53$, $p = .003$ parental monitoring ($p^2 = .01$: social disadvantage, marital transitions) Early Onset ($n = 53$) Exp $\beta = .52$, $p = -.48$, $p = .008$ effective discipline $\beta = .46$, $p = .033$ social disadvantage $\beta = .50$, $p = .006$ marital transitions $\beta = -.31$, $p = .097$ parental monitoring Chronic Offending ($n = 51$) Exp $\beta = .85$, $p = -.44$, $p < .02$ effective discipline $\beta = .48$, $p = .027$ social disadvantage $\beta = .42$, $p = .019$ marital transitions $\beta = -.32$, $p = .083$ parental monitoring (multivariate logistic regression analyses)
Shumow, Vandell, & Pouer	1998 Prospective longitudinal/ concurrent 2 yrs	Convenience/ Source specific: parents of 3rd graders in 9 urban public schools with highest % of subsidized school lunch, Milwaukee, WI; children in after school programs & matched (gender) random sample with mother after school	184	3rd > 5th gr M = 9.1 yrs T1	47%	Low M = \$15.365 M = 12.8 yrs maternal and 54% subsidized school lunch	48% Af/A 52% Cau	Parenting variables did not predict child behavior problems over time. Harsh parenting was concurrently associated with 3rd & 5th-grade behavior problems (parent report), & misconduct in 5th gr (child report) & lower adjustment in 5th gr (teacher report), accounting for family income & structure, parent education, race, & maternal unemployment. Firm- responsive parenting was associated with more child responsibility in 3rd grade & less 5th-grade misconduct & behavior problems. Permissive parenting was not associated with adjustment in 3rd or 5th gr.	Behavior Problem Grade 3, Parent Report $R^2 = .11$, $p < .01$, $\Delta R^2 = .04$; $F = 3.67$, $p < .05$ $\beta = .25$, $p < .01$ harsh parenting Behavior Problem Grade 5, Parent Report $R^2 = .22$, $p < .0001$, $\Delta R^2 = .06$; $F = 5.64$, $p < .01$ $\beta = .21$, $p < .05$ harsh parenting $\beta = -.21$, $p < .01$ firm-responsive parenting Misconduct Grade 5, Child Report $R^2 = .09$, $p < .05$, $\Delta R^2 = .07$; $F = 3.92$, $p < .05$ $\beta = .18$, $p < .05$ harsh parenting $\beta = -.23$, $p < .05$ firm-responsive parenting Adjustment Grade 3, Teacher Report $R^2 = .33$, $p < .0001$, $\Delta R^2 = .06$; $F = 4.69$, $p < .01$ $\beta = -.24$, $p < .01$ harsh parenting Child Responsibility Grade 5 $R^2 = .09$, $p < .05$ $\Delta R^2 = .06$; $F = 4.27$, $p < .01$ $\beta = .24$, $p < .001$ firm-responsive parenting (controls: race, income, education, family structure, unemployment) (hierarchical regression analyses)

Family Characteristics—Discipline and Conflict

Ages 7–13	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Wasserman, Miller, et al.	1996 Prospective longitudinal 15 mths	Convenience: recruited 6–10-yr-old brother(s) of male delinquents in New York City, NY, from court & probation records; 6% eligible agreed	112	$M = 8.9$ yrs T1	100%	Low $M = 11$ yrs caregiver ed	54% Afr 2% Cau 44% Hisp	Less parent-reported punishment & monitoring, & more parent-child fighting predicted increases in externalizing over 15 mths, after accounting for initial level of externalizing, parental involvement, parent rejection, & child reports of punishment & monitoring.	$\beta = -.23, p = .009$ punishment, parent report $\beta = .21, p = .03$ fighting $\beta = -.23, p = .009$ monitoring, parent report $\beta = -.20, p = .02$ parent communication (p 's = ns: parent involvement—emotional support, conflict-reject, child report—punish & monitoring) (linear regression analyses)
Ages 14–19									
Neighbors, Forehand, & Bau	1997 Prospective longitudinal/concurrent 6 yrs	Convenience: recruited divorced families from court records & nondivorced families by ads & fliers, midsize college town & metro area of large city, in the Southeast	243	$M = 13.1 >$ $M = 19.6$ yrs	47%	Middle $M = 32$ 11 hr–77 low Myers & Bean	100% Cau	Self-reported antisocial behavior in young adulthood was related to youths' perceptions of the quality of their relationship with father (conflict, communication, emotionality) & current interparental conflict (mother report), controlling for age, behavior problems, marital status, & interparental conflict in adolescence.	Antisocial Behavior, Young Adulthood, Self-Report Boys: $R^2 = .06, F = 2.20, p < .05$ $\beta = -.23, F = 4.96, p < .05$ relationship with father $\beta = -.35, F = 8.05, p < .01$ parent conflict Girls: $R^2 = .11, F = 3.50, p < .01$ $\beta = -.34, F = 14.8, p < .01$ relationship with father (controls: early adolescent behavior, age, parents' marital status, adolescent interparental conflict) (multiple regression analyses)
Sampson & Laub	1994 Concurrent/retrospective	Source specific: reanalysis of Gluecks' 1950 data; delinquents in correctional schools; matched controls (age, neighborhood, social disadvantage, ethnicity, & IQ) from public schools, Boston, MA, 1939–1948	1,000	$M = 14.7$ yrs (10–17 yrs)	100%	Low	100% Cau	Erratic/harsh discipline, low maternal supervision, & weak parent-child attachment were associated with delinquency, accounting for retrospective reports of child antisocial behavior, poverty, mobility, family disruption & size, parental defiance & instability, foreign birth, & maternal employment.	Official Delinquency Status $r^2 = .475, p < .05$ $\beta = .035, F = 4.22, p < .05$ harsh discipline ($p < .05$; supervision, parent-child attachment, family size, & child antisocial behavior) (maximum-likelihood logistic regression) Self-Parent-Teacher Report Delinquency $R^2 = .52$ $\beta = .013, F = 3.87, p < .05$ harsh discipline (p 's < .05; supervision, parent-child attachment, family size & delinquency, mobility, & child behavior) (OLS regression)
Steinberg, Lamborn, et al.	1994 Prospective longitudinal 1 yr	Convenience: recruited high school students in WI (3) & North CA (6) schools; urban, suburban, & rural areas; 15% of students absent on survey days; 5% refused	1,084–2,353	9th–11th gr	48%	Low–upper 29% < 16 yrs 71% ≥ 16 yrs parents ed	9% Afr 15% Asn 62% Cau 14% Hisp	Self-reported delinquent behavior of adolescents with neglectful parents increased after 1 yr while the delinquent behavior of adolescents with authoritative, authoritarian, or indulgent parents decreased or stayed the same.	Delinquency, Self-Report $\Delta = .11^*, T1 = 1.31$ neglectful $\Delta = -.02^*, T1 = 1.09$ authoritative $\Delta = -.03^*, T1 = 1.15$ authoritarian $\Delta = .01^*, T1 = 1.22$ indulgent (p 's < .001; superscripts Δ to differ $p < .10$ or less) (ANCOVA, F s not reported, post hoc comparison)

Family Characteristics—Discipline and Conflict

Authors	Year	Design	Sample	Age	% Male	SES	Ethnicity	Result	Key Statistics
Deater-Deckard, Dodge, et al.	1996	Prospective longitudinal 3 yrs	Representativeness Convenience: parents recruited in person during pre-registration for kindergarten or at beginning of school year through mail, telephone, or at school, Nashville & Knoxville, TN, & Birmingham, IN: 2 cohorts, 1987 & 1988	K > 7 3	52% T1	Low-upper M = 39.5 17% 1 32% 2 26% 3 16% 4 9% 5 1 hr-5 low Hollingshead	18% AFA 82% CauL T1	Maternal reports of physical discipline, low SES, male gender, single-mother marital status, & race by physical discipline interaction predicted school externalizing (teacher ratings of externalizing, peer-rated aggression, & peer-rated teacher-child conflict, averaged over 3 yrs). Higher levels of physical discipline predicted school externalizing for European-American but not African-American children. Mother-rated externalizing was predicted by high levels of physical discipline, male gender, low SES, & race. African-American mothers reported less externalizing, more physical discipline, lower SES, & more parent status than European American mothers.	School Externalizing, Teacher & Peer Ratings Step 1: $\Delta R^2 = .27, p < .001$ β 's = -.42 gender; -.20 SES, β 's < .001 β 's = -.17, $p < .001$ marital status Step 2: $\Delta R^2 = .25, p < .001$ β 's = .15, $p < .001$ discipline Step 3: $\Delta R^2 = .30, p < .001$ β 's = -.07, $p = ns$ African American $r = .31, p < .001$ Euro American Externalizing, Mother Ratings Step 1: $\Delta R^2 = .07, p < .001$ (marital status $p = ns$) β 's = -.13, $p < .05$ race β 's = -.09, $p < .05$ gender, -.26, $p < .001$ SES Step 2: $\Delta R^2 = .18, p < .001$ β 's = .35, $p < .001$ discipline Step 3: $\Delta R^2 = .18, p < .001$ β 's = -.22, $p = ns$ race > discipline (hierarchical multiple regressions, 3 steps, M's N/A) $r = .22$ race & physical discipline $r = -.40$ race & SES; -.21 race & marital status (p 's < .001, correlations)
Knight, Vicari, & Roosa	1994	Concurrent correlational	Convenience: recruited children & mothers in communities around 10 schools in 3 school districts of a large Southwestern metro area; schools offered prevention program for children of alcoholics; 50% of sample had 1 parent with a drinking problem	9-13 yrs	N/R	Low Caucasian: M = \$20k-\$25k M = 13.7 yrs parents and Mexican Am: M = \$10k-\$15k M = 11.4 yrs parents and	70% CauL 30% Hisp (Mexican Am)	Hostile control (maternal report) was positively related to conduct disorder (mother & child reports) for Anglo- & Mexican-American children, even after controlling for acculturation. For Anglo children, control & conduct disorder (maternal report), hostile control & conduct disorder (child report), & hostile control (maternal report), & hostile control (child report), were also positively associated. Hispanic mothers reported higher levels of control, hostile control, & inconsistent discipline than Anglo mothers, & Hispanic children reported higher levels of maternal control & hostile control than Anglo children. Mothers who were more acculturated reported less inconsistent discipline & hostile control, & their children reported less hostile control.	Control & Conduct Disorder r 's = .26 Anglo, ns Hisp M/Ch* Hostile Control & Conduct Disorder r 's = .39 Anglo, .28 Mex Am M/Ch* r 's = .32 Anglo, .25 Mex Am M/Ch r 's = .34 Anglo, ns Mex Am M/Ch Inconsistent Discipline & Conduct Disorder r 's = .28 Anglo, ns Mex Am M/Ch (* slopes differ $p < .05$; * intercepts differ $p < .10$) (M = mother, Ch = child report of (1) family, (2) conduct) (p 's < .05; r 's for analyses with acculturation as first step in hierarchical MR not reported, β 's < .05 as well) Hostile Control, Ethnic Group (mother report) $F = 25.3, p < .001, M$'s = 1.54 Anglo, 1.81 Mex Am Hostile Control, Ethnic Group (child report) $F = 14.1, p < .001, M$'s = 1.83 Anglo, 2.04 Mex Am Inconsistent Discipline, Ethnic Group (child report) $F = 15.6, p < .001, M$'s = 1.32 Anglo, 1.54 Mex Am Acculturation—Hostile Control r 's = -.25, $p < .05$ child; -.37, $p < .01$ mother Acculturation—Inconsistent Discipline $r = -.30, p < .01$ mother (see study for gender, control results) (ethnicity & gender ANOVA)

Family Characteristics—Discipline and Conflict

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Lombard, Dornbusch, & Steinberg	1996	Prospective longitudinal 1 yr	Convenience: recruited from 6 CA high schools	3,597	9th–11th	51%	Low-middle	5% AFA 18.5% Caud 60% Eur 15.5% Hisp	Unilateral adolescent decision making predicted an increase in deviant behavior after 1 yr for African-, Asian-, European-, & Hispanic-American adolescents. A decrease in deviant behavior after 1 yr was predicted by unilateral parental decision making for African-American adolescents, & joint decision making for Asian-, European-, & Hispanic-American adolescents.	Unilateral Adolescent Decision Making—Deviant Beh $\Delta B = .08, p < .05, \beta = .23 (n = 682)$ Afr-Am $\Delta B = .17, p < .05, \beta = .46 (n = 180)$ Afr-Am $\Delta B = .07, p < .001, \beta = .25 (n = 2,246)$ Eur-Am $\Delta B = .10, p < .05, \beta = .33 (n = 537)$ Hisp-Am Unilateral Parent Decision Making—Deviant Beh $\Delta B = -.20, p < .01, \beta = -.11 (n = 180)$ Afr-Am Joint Decision Making—Deviant Behavior $\Delta B = -.08, p < .05, \beta = -.22 (n = 682)$ Afr-Am $\Delta B = -.06, p < .01, \beta = -.19 (n = 2,246)$ Eur-Am $\Delta B = -.08, p < .05, \beta = -.25 (n = 537)$ Hisp-Am (regression analyses, control for 1987 decision making)

Unidn	1998	Concurrent group comparisons	Convenience: recruited 2-parent families via flyers from 1st to 4th grades of 20 schools in Miami, FL area; couples married or living together ≥ 2 yrs were eligible; 3–5% participation	110	7–11 yrs	100%	Low-upper 30% < \$30k 41% \$30k–\$60k 29% > \$70k $M = \$40k$ –\$49k ctrl, ADHD, ADHD/ODD $M = \$10k$ –\$19k ODD	7% AFA 36% Caud 57% Hisp *Caribbean Am included	Ethnic groups were equally represented in diagnostic & control groups. Lat-inconsistent parenting was highest for families of children diagnosed with oppositional defiant disorder (ODD) followed by ODD and ADHD, ADHD, & control families. Family conflict was higher for the ODD/ADHD group than the ADHD or control groups & higher for the ODD than control group. Parental rejection-coercion was higher for the 3 clinical groups than the control group. Family income was controlled in the analyses, & parenting measures included self-report & observational data.	Ethnic Group by Diagnostic Category $\chi^2 (3, N = 110) = 4.44, p = ns$ Multivariate $F (21, 282) = 9.43, p < .001$ Lat-inconsistent $F (3, 105) = 28.0, p < .001$ $M's = -.54^{***}$ control, $-.30^{**}$ ADHD, $M's = 1.23^{***}$ ODD, $.52^{**}$ ADHD/ODD Conflict $F (3, 105) = 17.31, p < .001$ $M's = -.50^{***}$ control, $-.07$ ADHD, $M's = .34^{**}$ ODD, $.76^{**}$ ADHD/ODD Parental rejection-coercion $F (3, 105) = 25.27, p < .001$ $M's = 1.45^{***}$ control, 2.39^{**} ADHD, $M's = 3.03^{***}$ ODD, 3.46^{**} ADHD/ODD (controlling for family income) ($M's$ with different letters differ $p < .05$) (MANCOVA, univariate tests, Bonferroni correction)
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Treatment & Preventative Interventions

Bank, Milroy, et al.	1991	Intervention random assignment 3-yr followup	Source specific: repeat offenders, 16 yrs & younger, referred by juvenile court, OR county; resident near to center	55	$M = 14$ yrs all ≤ 16 yrs	100%	Low-middle $M = 12$ yrs ad $M = 2.8$ maternal occ $M = 3.6$ paternal occ Hollingshead	N/R	Adolescents in the parent training (monitoring & discipline) treatment group spent less time in institutions during tx & 2 yr followup than youth who took part in traditional tx (family therapy, monitoring of school attendance/performance, group drug counseling). Rate of nonstatus offending declined for both tx groups* but youth in the parent training group showed reductions during the tx year, while controls showed reductions during yr 1 followup. The prevalence rate of nonstatus offenses declined for both groups; however, youth in the parent training group had fewer nonstatus offenses at yr 3 followup.	Institution Time, Tx, Followup 1, Followup 2 $U = 266.5, p < .04, M's = 28.5$ PT, 45.4 CC $U = 264.0, p < .03, M's = 33.9$ PT, 69.3 CC $U = 250.5, p < .07, M's = 34.4$ PT, 37.7 CC Nonstatus Offense Rates Wilks's $\Lambda = .73$ Baseline – Tx $F (1, 53) = 8.21, p < .01$ $M's = 3.6, 1.1$ PT, $3.9, 2.5$ CC Tx – Followup 1 $F (1, 53) = 2.12, p = .15$ $M's = 1.1, 1.4$ PT, $2.5, 1.1$ CC ($p's$ = ns; followup yrs 2 & 3) Nonstatus Prevalence Rates Wilks's $\Lambda = .72$ Followup Yr 3 $F (1, 53) = 4.25, p < .05$ $M's = 10$ PT, 17 CC Overall Offense Rates $p = ns$; group, $p < .01$; year Status Offense Rates $p = ns$; grp, yr, grp $\times$ yr *no treatment effects for status offenses (MANOVA, status, nonstatus, & overall offense rates) PT = parent training; CC = community control
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Family Characteristics—Discipline and Conflict Treatment & Preventative Interventions

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Resum	Key Statistics
Borduin, Mann, et al.	1995 Intervention random assignment 4-yr followup	Source specific: detained youth & their families were referred by juvenile services; youth had 2+ arrests & lived with at least 1 parent; Missouri Delinquency Project	176	12-17 yrs	68%	Low-middle 69% lower 4 & 5 on Hollingshead 1 in-3 low	30% Af/A 70% Cau	Adolescents & their families who completed multisystemic therapy (MST) demonstrated greater improvements in family relationships & parent-reported adolescent behavior than those who completed individual therapy (IT). Observations of mother-adolescent, father-adolescent, & mother-father dyads found increased supportiveness & reduced conflict-hostility for MST families. At 4-yr followup, MST completers had a lower risk of arrest than IT completers. In addition, MST completers who were arrested again had fewer overall arrests, & they were arrested for less serious crimes, compared to IT completers.	Supervisors, Pre - Post Intervention $F(1, 123) = 6.42, p < .01$ $g^2 = .14$ IT $M^2s = -.09, .23$ MST; $-.10, -.14$ IT $F(1, 64) = 9.18, p < .01$ $g^2 = .14$ father-youth $M^2s = .06, 1.06$ MST; $-.07, .23$ IT Conflict & Hostility, Pre - Post Intervention $F(1, 123) = 5.30, p < .01$ $g^2 = .14$ mother-youth $M^2s = .08, -.54$ MST; $-.11, -.22$ IT $F(1, 64) = 6.66, p < .01$ $g^2 = .14$ father-youth $M^2s = .15, -.63$ MST; $-.18, .27$ IT Behavior Problems, Mother Report, Pre - Post $F(1, 125) = 4.97, p < .05$ $g^2 = .14$ $M^2s = .17, -.54$ MST; $-.15, .64$ IT (see study for results for Mother-Father dyad & Time) Arrest Risk, 4-yr Followup, MST vs. IT Completers $\chi^2(1, N = 176) = 46.30, p < .0001, 26\%$ MST, 71% IT Recidivists, 4-yr Followup, g of Arrests $F(1, 82) = 10.36, p < .002, M^2s = 1.7$ MST, 5.4 IT Recidivists, Violent (control for pre-to violence) $F(2, 137) = 8.66, p < .003$ (M^2s not reported) Recidivists, Less Serious $F(1, 60) = 12.80, p < .0001, M^2s = 6.4$ MST, 9.7 IT (repeated measures, MANOVA, ANOVA, log-rank test, survival function)
Chamberlin & Reid	1998 Intervention random assignment 1-yr followup	Source specific: chronic delinquents referred by juvenile justice system for community placement, metro area of mid-size Pacific NW city	79	12-17 yrs	100%	N/R	6% Af/A 85% Cau 6% Hisp 3% Asia	Boys who participated in multidimensional treatment foster care (MTFC) showed a greater reduction in rate of official criminal referrals & reported less delinquency, index offenses, & felony assaults in the year following treatment than boys who received group care (GC). Participation in MTFC predicted official referral rates & self-reports of delinquency, index offenses, & felony assaults, even after accounting for pretreatment offense rates, age at first offense, & age at baseline.	Rate of Official Criminal Referrals $F(1, 77) = 3.93, p = .003$ group $\times$ time $M^2s = 8.5$ pre-to 2.6 post-to MTFC $M^2s = 6.7$ pre-to 5.5 post-to GC $R^2 = .15, \beta = -.213, t = -3.22, p = .002$ to group Delinquency, Self-Report, 1-yr Followup $F(1, 77) = 6.50, p = .01$ $M^2s = 12.8$ MTFC, 28.9 GC $R^2 = .24, \beta = -.23, t = -2.14, p = .04$ to group Index Offenses, Self-Report, 1-yr Followup $F(1, 77) = 5.30, p = .03, M^2s = 3.2$ MTFC, 8.6 GC $R^2 = .15, \beta = -.23, t = -2.05, p = .04$ to group Felony Assaults, Self-Report, 1-yr Followup $F(1, 77) = 4.10, p = .05, M^2s = 1.2$ MTFC, 2.7 GC $R^2 = .20, \beta = -.27, t = -2.33, p = .02$ to group (regression, step 1: age 1st referral, 2: age baseline, 3: pre-to criminal referral rate, 4: to group) (ANOVA, stepwise hierarchical multiple regression)

Family Characteristics—Discipline and Conflict Treatment & Preventative Interventions

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Results	Key Statistics
Patterson, Chamberlin, & Reid	1982 Intervention random assignment	Source specific: referred by medical/school personnel or parents for primary problem of social aggression, Pacific NW	19	3-11 yrs	58%	Low M's = \$570 ctrl, \$931 tx Income/mth M's = 4.4, 5.6 ctrl, tx Hollingshead	N/R	Children in the parent training group (monitoring, effective discipline, & reinforcement) showed a greater reduction in observed deviant behavior compared to children in the wait list/community-control group. All but 1 wait-listed child received tx in the community.	Deviant Behavior, Observed $F(1, 17) = 4.63, p < .01$ group $\times$ tx phase $F(1, 17) = 3.61, p < .08$ group $F(1, 17) = 12.81, p < .003$ trial M's = .32 baseline, .32 termination tx group M's = .89 baseline, .74 termination control Reduction: 63% tx group, 17% control (ANOVA)
Tremblay, McCord, et al.	1991 Intervention random assignment 1) tx 2) observed/surveyed 3) control recruit: age 6 tx: ages 7-9 tx: ages 10-12	Population: boys in 33 public schools, low-SES areas, Montreal, Canada were rated by kindergarten teachers; disruptive boys (>70%) with Canadian-born, French-speaking parents, < 15 yrs of school, were eligible	172 161 post 156 fu.1 147 fu.2 160 fu.3	6-12 yrs	100%	Low < 15 yrs parental ad	100% (French Canadian)	Boys who participated in a 2-yr preventative treatment program of parent training & positive reinforcement & boys' social skills training reported less theft in the home & less fighting both inside & outside the home 2 yrs after treatment ended compared to boys in the control/comparison groups. Mothers' ratings of disruptive behavior, particularly fighting, were higher for the treatment group immediately following treatment; however, there were no group differences for disruptive behavior after 1 yr, nor for fighting after 2 yrs.	Misbehavior, % Children Reporting 1 (+) Incident Fighting outside home $\chi^2(1) = 5.81, p = .03$; 40% tx, 55% ctrl, 64% obsv Fighting in the home $\chi^2(1) = 4.58, p = .03$; 28% tx, 43% ctrl, 49% obsv Theft in the home $\chi^2(1) = 5.50, p = .02$; 7% tx, 24% ctrl, 23% obsv Mother Ratings Child disruptive behavior $F = 5.32, p = .02$ post-tx M's = 13.3 tx, 10.4 ctrl, 11.0 obsv (p 's = ns; followup yrs 1 & 2) Fighting $F = 8.59, p = .004$ post-tx M's = 2.8 tx, 1.8 ctrl, 1.9 obsv $F = 5.61, p = .02$ followup 1 M's = 2.3 tx, 1.7 ctrl, 2.0 obsv $F = 3.39, p = .07$ followup 2 M's = 1.8 tx, 1.3 ctrl, 1.8 obsv Teacher Ratings: p 's = ns, F 's & M's not reported (chi-square, ANOVA)
Wahler, Carter, et al.	1993 Intervention random assignment 6- & 12- mth followups	Source specific: children referred to clinic from social service agency for oppositional/aggressive behavior at home & school; mothers had multiple stressors	29	7-13 yrs M = 7.5 yrs	79%	Low-middle M = 12.0 yrs maternal ad M = \$1,384 Income/mth	83% Caucasian 17% N/R	Mothers who attended a parent training intervention (monitoring, discipline, & reflective listening) that included synthesized teaching (training to discriminate child care stress from outside stress) as well as discussion demonstrated greater reductions in observed maternal indiscriminate responding & child aggressive behavior than mothers in the parent training/problem discussion group. No reductions were found in the clinic setting immediately following the 9-mth intervention; however, reductions were found in the home setting 6 & 12 mths following tx.	Maternal Indiscriminate Reactions, Home $F(3, 81) = 5.55, p < .01$ group $\times$ tx phase $F(1, 27) = 5.24, p < .05$ group followup 1 $F(1, 27) = 9.46, p < .01$ group followup 2 Apex M's = .10 tx, .14 fu.1, .13 fu.2 parent Apex M's = .15 tx, .05 fu.1 & fu.2 syn-parent Child Aggressive Behavior, Home $F(3, 81) = 5.50, p < .01$ group $\times$ tx phase $F(1, 27) = 9.80, p < .01$ group followup 2 Apex M's = .10 tx, .11 fu.2 parent training Apex M's = .10 tx, .02 fu.2 synthesis-parent Apex = approximate M's from figures (Note: synthesis teaching was conducted during baseline; no group differences were found at baseline) (ANOVA)

Family Characteristics—Discipline and Conflict Treatment & Preventative Interventions

Authors: Webster-Stratton
Year Design: 1998
Intervention: random assignment
1-yr followup

Size: 296 f-up
 394 post-ix

Representativeness: Source specific: recruited families entering Head Start program; 9 centers in 1 urban district; 2 cohorts, fall 1993 & 1994; Seattle, WA

Age: 4-6 yrs
 $M = 56.5$ mos

% Male: 53%

SSES: Low
 $M = \$10k$

Ethnicity: 17% Afri
 4% Asia
 63% Cau
 6% Hisp
 6% Mix
 4% NatA
 (one-b)

Result:

Families who took part in a parent training intervention in addition to Head Start showed greater improvements in maternal parenting & child behavior than families in Head Start alone. Mothers in the parent training IV reported less use of harsh & inconsistent discipline & more appropriate limit setting & were observed to use more competent discipline than mothers in the Head Start-only group. Children in the intervention group showed a greater reduction of observed problem behaviors, negativity, & noncompliance than did children in the control group. Treatment effects were maintained after 1 yr. Mother & teacher reports of child behavior problems did not show treatment effects.

Key Statistics:

Maternal Discipline, Self-Report
 Pre-Post: $t = -4.41, p < .001$ IV ($n = 394$)
 $M's = 1.28$ pre, 1.18 post IV
 Pre-followup: $t = -6.04, p < .001$ IV ($n = 296$)
 $M's = 1.26$ pre, 1.16 post IV, 1.09 followup IV
 Inconsistent Maternal Discipline, Self-Report
 Pre-Post: $t = -72.5, p < .001$ IV
 $M's = 1.38, 1.13$ IV
 Pre-followup: $t = -6.35, p < .001$ IV
 $t = -2.21, p < .05$ control
 $M's = 1.36, 1.14, 1.11$ IV; 1.29, 1.19, 1.19 ctrl
 Appropriate Limit Setting, Self-Report
 Pre-Post: $t = 10.34, p < .001$ IV
 $t = 3.39, p < .01$ control
 $M's = 4.33, 6.02$ IV; 3.67, 4.38 control
 Pre-followup: $t = 8.30, p < .001$ IV
 $M's = 4.32, 6.26, 5.75$ IV
 Discipline Competence, Observed
 Pre-Post: $t's = 6.83, p < .001$ IV
 $M's = 2.20, 2.42$ IV
 Pre-followup: $t's = 4.24, p < .001$ IV
 $M's = 2.22, 2.4, 2.39$ IV
 ($p's = ns$: control group, unless otherwise noted)
 (see Webster-Stratton, 1998 in "Validation" section for results of child behavior change)
 (MANOVAs, η^2 values = time ANOVAs ($p's < .05 - .001$), paired t -tests, pre vs. post & pre vs. followup)

Problem Solving, Ages 0-3

Authors: Zahn-Waxler, Lamond, et al.
Year Design: 1990
Prospective longitudinal
4 yrs

Source specific: mothers recruited from paraprofessionals in earlier study, sampling method not reported; each mother asked to bring in 1 mother & her child; sample included old & new mother-child pairs

Size: 44

Age: 2 > 6 yrs

% Male: N/R

SSES: Middle
 $M = 16$ yrs
 maternal ed

Ethnicity: 1% Afri
 98% Cau
 1% Eurasian

Mothers' child rearing practices & child behavior at age 2 predicted ratings of externalizing at age 3 for depressed mothers. Maternal guidance at age 2 (anticipatory, perspective taking & modulated control) attenuated the relationship between maternal depression & externalizing. Child dysregulated aggression was associated with greater externalizing for children of depressed mothers. Child reports of externalizing at age 6 were lower for depressed mothers who exhibited high maternal guidance, (age 2), and higher for children who exhibited dysregulated aggression at age 2.

Key Statistics:

Child Rearing Practice, Age 2—Externalizing, Age 3
 1: maternal diagnosis $R^2 = .26$
 $\beta = .49, \Delta F(1, 38) = 13.3, p < .001$
 2: sex of child $R^2 = .45$
 $\beta = -.27, \Delta F(2, 37) = 13.1, p < .001$
 3: peer play aggression $R^2 = .49$
 $\beta = .17, \Delta F(3, 36) = 2.88, p = .10$
 4: anticipatory, perspective taking $R^2 = .38$
 $\beta = .24, \Delta F(6, 33) = 4.60, p = .05$
 5: dysreg agg = maternal diagnosis $R^2 = .65$
 $\beta = .46, \Delta F(7, 32) = 6.99, p < .05$
 6: guidance = maternal diagnosis $R^2 = .71$
 $\beta = -.35, \Delta F(8, 31) = 6.42, p < .05$
 ($p's = ns$: 4, dysreg agg-child, 5, sensitivity-mom)
 Child Rearing Practice, Age 2—Externalizing, Age 6
 1: maternal diagnosis $R^2 = .28$
 $\beta = .30, \Delta F(4, 35) = 9.12, p = .005$
 2: dysregulated aggression $R^2 = .44$
 $\beta = .44, \Delta F(8, 31) = 5.17, p = .05$
 (stepwise multiple regression)

Family Characteristics—Problem Solving

Ages 4-6

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Hooven, Gottman, & Katz	1995 Prospective longitudinal 3 yrs	Convenience: recruited nonclinical sample from Champaign- Urbana, IL, community through newspaper ads; screened for range of marital satisfaction	56	4-5 yrs > 8 yrs	56%	Low- middle	N/R	Mother's coaching of child's anger at age 5 predicted lower mother- rated oppositional behaviors (age 5), fewer behavior problems (age 6), & lower teacher ratings of internalizing (age 6). Coaching of child's anger by either parent was associated with less negative play with peers (age 5).	Mother Coaching, Age 5 $r = -.27, p < .10$ mother OCL, age 9 $r = -.36, p < .05$ teacher internalizing, 8 $r = -.32, p < .05$ opposition, age 5 $r = -.31, p < .05$ negative play, age 5 Father Coaching, Age 5 $r = -.30, p < .05$ negative play, age 5 (correlations)

Ages 7-13

Coughlin & Vuchnich	1996 Prospective Longitudinal 7 yrs	Regulation: recruited from schools in neighborhoods with high delinquency rates, metro area of midsize OR city	194	10 > 17 yrs $M = 9.7$ yrs 71	100%	Low $M = \$16k$ (\$3k-\$35k)	98.5% Cau 1.5% Mix	Better family problem solving at age 10 predicted fewer arrests by age 17 for boys from stepfamilies, taking into account success in peer relations & child's antisocial traits (child, parent, & teacher reports of antisocial acts). Better family problem solving was associated with more arrests in single-mother families.	Stepfamilies ($n = 59$) 75% correct prediction $OR = 0.47, p < .05$ family problem solving $OR = 0.23, p < .001$ peer relations $OR = 2.09, p = ns$ antisocial trait Single-mother Families ($n = 55$) 73% correct $OR = 0.42, p < .05$ family problem solving $OR = 2.25, p < .05$ peer relations $OR = 2.59, p < .10$ antisocial trait (logistic regressions)
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Vuchnich, Wood, & Vuchnich	1994 Concurrent group comparisons correlational	Convenience: (1) referred; behavior problems; (2) 4th gr, no risk or problems; 20% response; (3) at-risk 4th-gr boys, high-delinquency areas midsize NW city	188 triads 1 = 30 2 = 80 3 = 68	8-13 yrs	69%	Low-middle	N/R	Better family problem solving was related to lower levels of externalizing. Children referred for behavioral problems had the lowest levels of family problem solving, followed by children in the at-risk group, followed by the comparison group.	Family Problem Solving—Externalizing $r = -.31, p < .001$ Family Problem Solving $F(2, 185) = 23.0, p < .05$ $M's = 11.9$ referred, 13.9 at risk, 16.4 comparison (all $M's$ different, $p < .05$) (ANOVA, Scheffé test)
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Treatment & Preventative Interventions

Snyder, Horne, et al.	1988 Intervention random assignment followup 9-12 mos	Convenience: recruited from referrals to tx by school personnel; most aggressive students in classroom, midsize Midwestern city	37 families 20 72	2nd-6th gr	100%	N/R	N/R	Children & families in the intervention group showed improved problem solving abilities (more positive & fewer negative solutions) compared to controls. Reductions in parent reports of aggression & externalizing, & teacher reports of deviant classroom behavior were greater for children in the intervention group compared to controls. These changes were maintained at 9-12-mth followup.	Externalizing, Parent Report $p = .001, M's = -10.90$ tx, -76 ctrl Aggressive Behavior, Parent Report $p = .001, M's = -11.75$ tx, -11.12 ctrl + Solutions, Observed $p = .02, M's = 12.2$ tx, -5.22 ctrl - Solutions, Observed $p = .005, M's = -10.4$ tx, 8.67 ctrl (ANOVA on gain scores, $F's$ not reported) Reduction, Deviant Classroom Behavior, Teacher Report 40% $p = .002$ tx; 18% $p = .70$ control Followup, 9-12 mths ($n = 20$) Externalizing, $F = 7.48, p < .001$ $M's = 73.4$ pre, 62.3 post, 62.3 followup Aggressive behavior $F = 7.35, p < .001$ $M's = 12.9$ pre, 6.3 post, 8.7 followup Positive solutions $F = 9.07, p < .001$ $M's = 64$ pre, 75 post, 76 followup Negative solutions $F = 7.65, p < .001$ $M's = 25$ pre, 14 post, 15 followup (repeated measures ANOVA)
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Family Characteristics—Structuring of the Learning Environment

Ages 7–13

Authors:
Jenkins

Year Design:
1997 Concurrent
correlational

Representativeness:
Convenience:
recruited from
middle school in DE,
students from urban
& suburban areas;
83% participation

Size:
754

Age:
7th & 8th gr
11–15 yrs

% Male:
50%

SES:
Low-middle
20% quality
free/reduced-
price lunch

Ethnicity:
22% A/A
66% C/C
3% A/H
5% H/H
4% Other

Results:

Parent involvement in school
was indirectly associated with
lower school crime & lower
school misconduct through
students' greater attachment
& commitment to school, &
belief in school rules, taking
into account gender, mother's
education, race, grade, math
ability, sibling in school, &
living with a step-parent.

Key Statistics:

School Crime
 $R^2 = .32, p < .05$
 $r = .15$ parent involvement—belief
 $r = .23$ belief—school crime
 $r = .11$ parent involvement—commitment
 $r = .35$ commitment—school crime
School Misconduct
 $R^2 = .29, p < .05$
 $r = .15$ parent involvement—belief
 $r = .15$ belief—school crime
 $r = .11$ parent involvement—commitment
 $r = .26$ commitment—school crime
 $r = .11$ parent involvement—attachment
 $r = .26$ attachment—school crime
(model includes gender, mother's education,
race, grade, math ability, sibling in school,
& living with a step-parent)
(path analysis)

Keywords:
Ryan,
& Adams

1996 Concurrent
correlational

Convenience:
recruited from 7
Catholic elementary
schools in southern
Ontario, Canada,
52–55% response

Size:
312

Age:
4th & 7th gr
4th, 9–13 yrs
7th, 12–15 yrs

% Male:
48%

SES:
Middle
20% 12 yrs
60% > 12 yrs
parent ad

Ethnicity:
100% C/C

For 4th graders, perceived maternal
pressure to achieve academically
had positive direct effects on teacher-
reported externalizing. Parental
pressure to achieve had indirect
positive effects on externalizing,
through lower frustration tolerance
& intellectual effectiveness, & indirect
negative effects, through lower
asertiveness. Paternal support had
positive direct & indirect effects
(through lower frustration tolerance
& intellectual effectiveness), while
no effect was found for maternal
support. For 7th graders, maternal &
paternal pressure to achieve had
indirect positive effects on external-
izing through lower frustration
tolerance & lower intellectual effect-
iveness. Maternal & paternal support
had indirect positive effects (through
higher asertiveness) & negative
effects (through higher frustration
tolerance) on externalizing.

Mothers, Grade 4

$\chi^2(12) = 18.80, p = .08, AGFI = .92, R^2 = .65$
 $r = .15$ pressure to achieve—externalizing

Fathers, Grade 4

$\chi^2(8) = 11.90, p = .16, AGFI = .98, R^2 = .65$
 $r = .10$ support—externalizing
 $r = .20, .83$ pressure—frust, frust—ext
 $r = .33, .22$ pressure—int eff, int eff—ext
 $r = .20, .54$ pressure—asert, asert—ext
 $r = .19, .83$ support—frust, frust—ext
 $r = .12, .22$ support—int eff, int eff—ext

Mothers, Grade 7

$\chi^2(12) = 18.80, p = .08, AGFI = .92, R^2 = .45$
 $r = .14, .29$ pressure—frust, frust—ext
 $r = .28, .24$ pressure—int eff, int eff—ext
 $r = .13, .58$ support—asert, asert—ext
 $r = .16, .10$ support—frust, frust—ext

Fathers, Grade 7

$\chi^2(8) = 11.90, p = .16, AGFI = .98, R^2 = .45$
 $r = .17, .79$ pressure—frust, frust—ext
 $r = .30, .24$ pressure—int eff, int eff—ext
 $r = .15, .57$ support—asert, asert—ext
 $r = .14, .10$ support—frust, frust—ext

pressure = pressure to achieve, frust = frustration
tolerance, int eff = intellectual effectiveness, asert =
asertiveness, support = parental support
($p < .05$)
(structure equation models)

Family Characteristics—Structuring of the Learning Environment Ages 14–19

Authors	Year	Design	Sample	SES	% Male	Age	SES	Ethnicity	Result	Key Statistics
Aseltine	1995	Prospective longitudinal 2 yrs 3 waves 1 yr apart	Convenience: recruited from 3 high schools in middle-class neighbor- hoods, metro area, Boston, MA	43% Middle T1: 3% < 12 yrs 33% = 12 yrs 13% < 16 yrs 39% > 16 yrs parental ad	43%	9th–11th gr	Low-middle 92% middle & professional 8% lower/ working	2% AFA 2% AFA 94% Cau 2% Hisp	Adolescent-reported parental monitoring was associated with lower exposure to delinquent peers over time & unrelated to adolescent-reported delinquency. Gender, age, family type, living standard, & parent education were included in the model.	$\chi^2(60) = 50.91, p < .79, AGFI = .987$ $\beta = -.185, p < .05$ monitoring T2—peer del T3 $\beta = -.134, p = ns$ monitoring T2—del del T3 (model includes gender, age, living status, parent education, & family type) (covariance structure models)
Fletcher, Darling, et al.	1995	Concurrent correlational	Convenience: recruited students from high schools in WC (3) & Northern CA (6); urban, rural, & suburban areas; 15% of students absent on day of survey; 5% refused; over 50% of 11,000 participants had missing data on questions about friends	Low-middle 92% middle & professional 8% lower/ working	43%	9th–12th gr 14–18 yrs	Low-middle 92% middle & professional 8% lower/ working	9% AFA 14% AFA 85% Cau 10% Hisp 1% N/A < 1% Hisp < 1% Pacs	Adolescent perception of parental monitoring was associated with lower levels of delinquency, even after accounting for home authoritativeness & peers' delinquency.	Home & Network Authoritativeness r 's = .12 boys, .15 girls, p 's < .01 Home Authoritativeness & Delinquency r 's = -.17 boys, -.20 girls, p 's < .001 Home & Network Authoritativeness, Delinquency β 's = -.25 boys, -.38 girls, p 's < .01 home β 's = -.14 boys, -.21 girls, p 's < .01 network β = .10, $p = ns$ boys' interaction β = .25, $p < .01$ girls' interaction Network Authoritativeness, Delinquency β = -.06, $t(1,1379) = -2.35, p < .05$ boys β = -.07, $t(1,1394) = -3.07, p < .01$ girls β = -.07, $t(1,1394) = -3.07, p < .01$ girls (controlling for parent authoritativeness & peer delinquency; parent & peer β 's not reported) (hierarchical regression analyses)

Modeling Antisocial/Norm-Maintaining Behaviors, Ages 0–3

Authors	Year	Design	Sample	SES	% Male	Age	SES	Ethnicity	Result	Key Statistics
Jouriles, Murphy, et al.	1991	Concurrent correlational	Convenience: Study 1: recruited mothers in intact families from pre-schools, public records, & birth announcements; suburban Suffolk County, NY	Lower–upper middle	100%	36–42 mos $M = 39$ mos	Lower–upper middle	N/R	Child-rearing disagreements were associated with boys' behavior problems at age 3, after accounting for general marital disagreements or exposure to marital conflict.	Behavior Problems Age 3 Step 1: General marital disagreement $R = .15, \Delta R^2 = .02, \Delta F = 4.57, p < .05$ Step 2: Child-rearing disagreements $R = .35, \Delta R^2 = .10, \Delta F = 20.73, p < .001$ (hierarchical regression analyses) Behavior Problems Age 3 & Child-Rearing Disagree Partial $r = .27, p < .001$ (exposure controlled) ($p = ns$: exposure, child-rearing disagree controlled) (partial correlations)
		Correlational	Study 2: recruited intact families from nursery schools & through newspaper ads; suburban Harris County, TX	Lower–upper middle	100%	48–75 mos $M = 61$ mos	Lower–upper middle	N/R	Lower general marital adjustment, more exposure to conflict, & more child-rearing disagreements were associated with more behavior problems for age 5 boys. Child-rearing disagreements did not exert effects independent of general marital adjustment or exposure to conflict.	Behavior Problems Age 5 Step 1: General marital disagreement $R = .17, \Delta R^2 = .03, \Delta F = 2.64, p < .05$ Step 2: Child-rearing disagreements $R = .22, \Delta R^2 = .02, \Delta F = 1.63, p = ns$ (hierarchical regression analyses) Behavior Problems Age 5 $r(85) = -.12, p < .05$ general marital adjustment $r(85) = .22, p < .05$ exposure to conflict $r(85) = -.17, p < .05$ child-rearing disagreements (p 's = ns: child-rearing disagreements when exposure controlled & exposure, when child-rearing disagreements controlled correlations, partial correlations)

Family Characteristics—Modeling Antisocial/Norm-Maintaining Behaviors

Ages 4–6

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Schwartz, Dodge, et al.	1997 Prospective longitudinal 5 yrs	Convenience: parents recruited during pre-registration for kindergarten, Nashville, Knoxville, TN, & Birmingham, IN	520	Pre-K > 3rd, 4th gr	100%	Low-middle	21% Afr 77% Cau 2% Other	According to mother reports, boys who were both aggressive & bullied (aggressive victims) in middle childhood had experienced more marital & parental aggression at home in early childhood than passive victims, nonvictim aggressors, & controls, & more marital conflict than passive victims or controls. Nonvictimized aggressors had been exposed to more violence than control boys.	Home Environment & Aggressor/Victim Status Wilk's $\lambda = .81$, $F(27, 354) = 2.39$, $p < .001$ gr Parental use of aggressive strategies $F(3, 182) = 5.12$, $p = .005$ $M's = 1.2^{nd}$ aggressive victim -0.1 st passive victim 0.2 nd nonvictim aggressor 0.1 st ctrl Dyadic marital aggression $F(3, 138) = 6.43$, $p = .0005$ $M's = 1.2^{nd}$ aggressive victim -0.6 th passive victim 0.1 st nonvictim aggressor -0.1 st ctrl Marital conflict $F(3, 182) = 5.43$, $p = .005$ $M's = 2.9^{th}$ aggressive victim 1.8 th passive victim, 2.0 control th Exposure to violence $F(3, 182) = 3.65$, $p = .05$ $M's = 2.3^{rd}$ nonvictim aggressor 1.7 th ctrl ($M's$ with same subsample differ, $p < .05$) (MANOVA, ANOVA, planned comparisons)

Ages 7–13

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Farrington & Hawkins	1991 Prospective longitudinal 24 yrs	Population: sampled all boys ages 8–9 from 6 state primary schools & 1 special ed school, working-class area of London, 1961–1962	411	8–9 > 32 yrs	100%	Low 23% < \$15 30% > \$20 income/week	90% Cau < 10% W Ind < 10% Crypt	Convicted between ages 10 and 20 were predicted by having a convicted parent, accounting for child troublesomeness from ages 8–10. Having a delinquent older sibling predicted convictions between ages 10 and 20, once parent conviction, child troublesomeness, delinquency, & low school attainment were taken into account.	Convictions Ages 10–20 $R^2 = .47$ Convicted parent, age 10 $R^2 = .36$, $r(4) = .26$, $\Delta F = 17.17$, $p < .001$ (controlling for early antisocial behavior) Delinquent older sibling, age 10 $R^2 = .44$, $r(4) = .19$, $\Delta F = 4.92$, $p < .05$ (controlling for early antisocial behavior, convicted parent, high delinq, & low school attainment) (forward stepwise multiple regression)
Gorman-Smith, Tolan, et al.	1998 Prospective longitudinal 4 yrs	Population: recruited 5th & 7th grade boys in 17 public inner-city schools, Chicago, IL	288	11–15 > 15–18 yrs	100%	Low 74% < \$20k 48% < \$10k	N(8%) Afr N(8%) Hisp	Compared to nondelinquent adolescents, serious chronic offenders were more likely to come from families characterized by deviant behaviors & attitudes (general antisocial or antisocial behavior) & multiple problems (disruption-conflict & low parental involvement). Chronic minor offenders were less likely to come from deviant families, & escalating or late onset offenders were more likely to come from families with disruption & conflict than nondelinquent adolescents.	Family Pattern & Delinquency Pathways— Multiple Problems, Including Deviance & Conflict $\chi^2(M = 287) = 4.30$, $p < .05$ serious Chronic $\beta = .92$, OR = 2.51, 90% CI = 1.2–5.3 ($p = ns$: chronic minor & escalating offenders) Deviant Behavior & Attitudes $\chi^2(M = 287) = 3.72$, $p < .10$ chronic minor $\beta = -.70$, OR = 2.29, 90% CI = 1.1–4.8 ($p = ns$: serious chronic & escalating offenders) Disruption & Conflict $\chi^2(M = 287) = 3.52$, $p < .10$ escalating $\beta = .83$, OR = 2.25, 90% CI = 1.1–4.8 ($p = ns$: chronic minor & serious chronic offenders) (polychotomous logistic regression model)

Family Characteristics—Modeling Antisocial/Norm Maintaining Behaviors Ages 14–19

Authors	Year Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Davies & Windle	1997 Prospective longitudinal 2 yrs 4 waves 6 mths between measure of marital discord & delinquency	Convenience: recruited 10th- & 11th- grade students & primary caregiver from 3 suburban high schools, western NY	443	M = 15.5 yrs T1	46%	Middle Mdn = \$40k 2% < \$12k M = 13.7 yrs maternal ed	0.5% AFA 0.5% Asian 97% Caucasian 0.5% Hispanic	Family discord (marital discord & low levels of family intimacy) mediated the relationship between maternal depressive symptoms & delinquency for girls. For boys, delinquency was associated with low levels of family intimacy.	Key Statistics Delinquency, Boys & Low Family Intimacy $r = .20, p < .01$ (correlation) Delinquency, Girls, Unrelated Model $R^2 = .02, \beta = .14, p < .05$ maternal dep symptoms (regression, maternal dep only predictor in equation) Girls, Mediated Model $\Delta R^2 = .03, p < .05$ $R^2 = .03, \beta = .12, p < .05$ maternal discord $R^2 = .09, \beta = .13, p < .005$ low family intimacy (β 's = ns: parental impairment, stressful events, maternal depressive symptoms) (hierarchical multiple regression, family discord terms entered 1st, followed by maternal depressive symptoms) Exposure to Conflict & Delinquency $\chi^2(31) = 35.44, p = .27, OR = .957$ $\beta = .29^*, p < .20$ mother/childing $\beta = .23^*, p < .20$ father/childing (*results similar across 3 sibling groups: both the siblings, nondivorced family; both step-siblings, remarried; 1 biological/1 step-sibling, remarried) (latent variable structural equation models) Antisocial Behavior, Boys, Self-Report $R^2 = .06, F = 2.20, p < .05$ $\beta = -.35, F = 8.05, p < .01$ interparental conflict $\beta = -.23, F = 4.98, p < .05$ relationship with father (β 's = ns: age, early adolescent behavior, parental marital status, early parent conflict) Antisocial Behavior, Girls, Self-Report $R^2 = .13, F = 3.50, p < .01$ $\beta = -.34, F = 14.8, p < .01$ relationship with father (β 's = ns: age, early adolescent behavior, early & current parent conflict, parental marital status) (multiple regression analyses) Exposure to Parent Conflict & Externalizing Maternal model $R^2 = .50, F(5, 87) = 12.23, p < .01$ $\beta = -.26$ interparental conflict—self-regulation $\beta = .27$ family cohesion—self-regulation $\beta = -.65$ self-regulation—externalizing $\beta = -.23$ reciprocity—externalizing Paternal Model $R^2 = .47, F(5, 87) = 15.25, p < .01$ $\beta = -.26$ interparental conflict—self-regulation $\beta = .27$ family cohesion—self-regulation $\beta = -.65$ self-regulation—externalizing $\beta = -.15$ reciprocity—externalizing (latent variable path analysis)
Meltz, Hetherington, & Reiss	1996 Concurrent correlational	Population: recruited national sample from random dialing, market survey, same-sex siblings, biert & nonbiert, from nondivorced & remarried families	516	11–18 yrs	N/A	Middle– upper middle M = \$25k–\$35k M = 13.8 yrs parent ed	94% Caucasian 6% N/A	Sibling differences in exposure to marital conflict (average mother, father, & adolescent report) were associated with differences in self- reported sibling delinquency. Siblings exposed to more marital conflict were at higher risk for delinquency.*	
Neighbors, Foreland, & Liu	1997 Prospective longitudinal 6 yrs	Convenience: recruited divorced families from court records & nondivorced families by ads & fliers; middle college town & metro area of large city in the Southeast	243	M = 13.1 > M = 19.6 yrs	47%	Middle M = 32 11 f–77 fow fliers & Bean	100% Caucasian	Boys' self-reported antisocial behavior in young adulthood was associated with current interparental conflict (mother report) & quality of relationship with father (adolescent perception), accounting for early adolescent problem behavior, age, marital status, & parents' behavior in young adulthood was associated with perceived quality of their relationship with father.	
Ethnic Minority Populations Brack, Stoneman, & Wiser	1996 Concurrent correlational	Convenience: 2-parent families with firstborn children ages 9–12 were recruited from schools, churches, & community centers in rural (population under 2,500) GA & SC	90	9–12 yrs	47%	Low-middle M = \$25,053 (\$2.5k–\$57.5k) 19% poverty	100% AFA	Exposure to parental conflict (parent reports) had an indirect positive effect on mother & teacher ratings of externalizing through lower youth self- regulation, after accounting for per capita income, parental education, & family cohesion.	

Peer Influences

Peers play an important role in child development. Particularly as children mature into adolescents, peers play a large role in shaping both appropriate and inappropriate behaviors. However, newer evidence indicates that as early as preschool, peers begin to exert noticeable influences on child aggressive behavior. Research on the influence of peers on externalizing behavior problems can be categorized into three domains—peer rejection of aggressive behavior, peer victimization, and peer enhancement of aggression and antisocial behavior.

At first glance, the first and third domain may appear contradictory. How can aggressive behavior be rejected and also enhanced by peers? This seeming contradiction is at the heart of peer influence on externalizing behavior problems. Aggressive behavior may be rejected by conventional peers and at the same time negatively and positively reinforced. Rejection by conventional peers encourages similarly aggressive and rejected children to find one another, form friendships, and develop ways of approving and accepting aggression. Although much is known about predictive and causal risks within each domain, the interdependence, potential sequencing, and points of vulnerability across domains of peer influence are not well established.

Peer Rejection of Aggressive Behavior

Peer rejection has been shown to be a middle-

childhood predictive risk factor for adolescent conduct problems over and above its concurrent correlation with childhood aggression. Several longitudinal studies have documented that children who are both rejected by their peers and highly aggressive exhibit the poorest overall adjustment in elementary school (Bierman & Wargo, 1995; Lochman & Wayland, 1994). As early as first grade, children who come from families marked by higher amounts of conflict and coercion are more likely to engage in aggressive interactions with peers (Dishion, Duncan, Eddy, Fagot, & Fetrow, 1994; Schwartz, Dodge, Pettit, & Bates, 1997). In turn, aggressive children who are rejected by their peers are at increased risk for behavior problems prior to middle school (Bierman, Smoot, & Aumiller, 1993; Bierman & Wargo, 1995). For boys, the predictive relationship between early aggression and peer rejection and later externalizing behavior problems has been documented into adolescence (Coie, Terry, Lenox, Lochman, & Hyman, 1995).

To understand why peer rejection has such negative effects for children, one must recall research described in the Child Characteristics section. Children who are both rejected and aggressive show a more pervasive pattern of behavioral and social deficits—including inattention, argumentative and disruptive behaviors, and poor prosocial behavior—unlike children who are aggressive but not rejected or rejected but not aggressive. Also, children who are both rejected and aggressive are more likely than their nonaggressive well-liked peers to develop biased social information processing involving a

tendency to attribute hostile intentions to others (Dodge, 1980; Dodge & Frame, 1982). This attributional style increases the likelihood that they will respond toward other children in a retaliatory, aggressive manner (see Child Characteristics section for more details).

Evidence exists that peer rejection associated with aggression is malleable and can function as a causal risk factor for externalizing behavior problems. By specifically targeting children who appear rejected because of their aggressive behavior, interventions that provide anger management skills and prosocial means of solving peer conflicts have resulted in increased peer acceptance and decreased child aggressive and externalizing behavior problems (Conduct Problems Prevention Research Group, 1999; Lochman, Coie, Underwood, & Terry, 1993).

Victimization

In addition to the negative attributional biases exhibited by rejected and aggressive children, evidence shows that peers are more likely to attribute hostile intentions and respond more aversively when the perpetrator is considered an aggressive youngster (Dodge, 1980; Dodge & Frame, 1982). Rejected youth are more likely to be treated negatively by their peers and are more likely to be victims of peer attack and abuse (Perry, Kusel, & Perry, 1988). Newer research has documented that the victimization experienced by socially rejected children includes not only physical attacks but also acts that undermine their relationships with other peers (i.e., relational aggression) (Crick, Casas, & Ku, 1999; Crick & Grotpeter, 1996). The correlation between peer rejection and relational aggression victimization has been found for children in preschool and elementary school.

Adding to the work on early peer victimization is the consistent correlation between being a victim of crime and being a criminal offender (Esbensen & Huizinga, 1991; Sampson & Lauritsen, 1990; Singer, 1986). Adolescents who are offenders are likely to be victims, and vice versa. It is not clear whether criminal victimization predicts later offending or whether early offending predicts later victimization. Also, it is not known whether criminal victimization in adolescence is predicted by the experience of peer victimization in elementary and middle school.

Peer Enhancement

Although aggressive children are at higher risk for peer rejection, aggressive and rejected children do have friends, and their friends also tend to be aggressive (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Haselager, Hartup, van Lieshout, & Riksen-Walraven, 1998; Tremblay, Masse, Vitaro, & Dobkin, 1995). As early as preschool, research has documented aggressive children to be part of social cliques that are particularly likely to be characterized by aggression (Farver, 1996). Aggressive friendships tend to be stable (Giordano, Cernkovich, & Pugh, 1986), and being a member of a group with other aggressive children and/or adolescents is a predictor of later conduct problems for both girls and boys (Kupersmidt, Burchinal, & Patterson, 1995).

Selection of mutually aggressive and deviant friends can expand in adolescence to pairings with the opposite sex. Antisocial behavior is a strong selection factor in couple formation. Individuals with a history of antisocial behavior in adolescence are likely to become partners with similar individuals (Krueger, Moffitt, Caspi, Bleske, & Silva, 1998). In turn, assortive pairing for antisocial behavior is associated with continued involvement in antisocial behavior during the adult years (Yamaguchi & Kandel, 1993). In contrast,

supportive, nondeviant partners are a source of protection, breaking the continuity in antisocial behavior between adolescence and adulthood (Quinton, Pickles, Maughan, & Rutter, 1993).

Peers also serve to reinforce aggressive behavior, particularly for children who have difficulty with aggression (Snyder, Horsch, & Childs, 1997). Young (preschool- and elementary school-aged) aggressive children are much more likely to initiate, reciprocate, and persist with aversive behavior with their peers than are nonaggressive children (Snyder & Brown, 1983). In elementary school, research on bullying (the assertion of power through aggression, repeated over time and intended to cause harm) has found the peer group to be critical in maintaining, exacerbating, and terminating bullying. Peers tend to give positive attention to bullies by watching, cheering, and sometimes joining the bully. The positive attention has been correlated with longer bouts of bullying (O'Connell, Pepler, & Craig, 1999). Also, boys who bully in early adolescence have been shown to be at higher risk for antisocial behavior in adulthood (Farrington, 1993). Although several antibullying programs have been developed for schools, these interventions have not specifically targeted peer processes in bullying.

The role of peers in enhancing delinquent and antisocial behavior in adolescence is well established. Most of the externalizing behavior problems of adolescents—including violent acts toward others—occur in deviant peer groups. For elementary- and middle school-aged boys, association with deviant peers is not only correlated concurrently with conduct problems but is also a predictive risk factor for increased involvement over time (Elliott, Huizinga, & Menard, 1989; Keenan, Loeber, Zhang, Stouthamer-Loeber, & Van Kammen, 1995; Patterson, 1993; Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). Deviant peers also engage in forms of deviancy training in which antisocial talk (e.g., bragging about physical assaults, discussing

delinquent acts) meets with approval and positive reinforcement (Dishion, Eddy, Haas, Li, & Spracklen, 1997). In highly deviant groups (i.e., juvenile street gangs), group membership is correlated with increased delinquent behavior (Bjerregaard & Smith, 1993). Studies following youth before, during, and after their gang membership show that rates of delinquency, especially violent delinquency, are substantially higher when a young person is a member of a gang than either before or after membership (Esbensen & Huizinga, 1993; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993).

The most powerful evidence for documenting peer enhancement of conduct problems as a causal risk factor comes from failed interventions that involved grouping together high-risk youth. Interventions that group together high-risk youth, even in the presence of therapeutic intervention, have been shown to result in increasing delinquent behavior (Dishion & Andrews, 1995; Dishion, McCord, & Poulin, 1999). In contrast, research on therapeutic foster homes for delinquent youth that involve definitive changes in parenting and strict enforcement of no contact with deviant peers shows that these interventions result in decreased delinquency (Chamberlain & Reid, 1998).

Clearly, peer enhancement of conduct problems is a significant causal risk factor for antisocial behavior. By adolescence, the only established way to effectively reduce this influence is to remove contact with deviant peers. It is not known whether interventions aimed at reducing early peer reinforcement of aggressive behavior or bullying also may be effective in reducing conduct problems and deterring development of delinquent behavior. Nor is it known whether interventions designed to decrease peer rejection also may decrease peer enhancement of aggressive behavior. Given the strength of evidence about the role of peers in externalizing behavior problems, these questions appear ripe for investigation.

Implications for Malleable Peer Risk Factors and Developmental Processes

Research on peer influences shows that, beginning in elementary school, peers can have profound causal effects on externalizing behavior problems. Within the first years of school, one can see peer rejection of aggressive children, aggressive children beginning to form relationships with similarly aggressive children, and peers beginning to attribute greater hostile intent and aversion to aggressive classmates. At the same time, aggressive children are more likely to engage in and escalate their aggressive behavior with aggressive peers, to develop hostile attributional styles for interpreting social encounters with others, to be the victim of peer attacks, and to bully others. This vicious cycle of early peer rejection, hostile attributional processes, and increased aggressive behavior, however, is malleable. Interventions that target early aggressive behavior by providing anger management skills and prosocial means of solving peer conflicts and reducing hostile intent toward others have resulted in increased peer acceptance and decreased externalizing behavior problems.

It is critical to expand on these important results in two ways. First, the outcomes from these interventions should be expanded beyond peer rejection and hostile intent to include indices of peer victimization and formation of peer cliques. Are the skills learned through intervention generalizable to these domains of peer influence? Also, long-term effects need to be documented. If these early interventions are successful in deterring the formation of aggressive and antisocial cliques, this could have profound effects during adolescence by deterring association with deviant peers and preventing the escalation of serious antisocial behavior. Clearly, long-term followup of these interventions is needed.

The second way to expand these interventions is through research to determine ways of effectively translating the interventions for use by communities, schools, and mental health service systems. School policies, classroom structure, and classroom management also may correlate with externalizing behavior problems (see the Broader Social Environment, Communities, and Schools section), which could intensify or constrain interventions. Critical issues will need to be addressed: who will receive the intervention (all children or only targeted high-risk children), when in development the intervention will be most effective (e.g., early versus late elementary school), for whom the intervention should continue, who should administer and deliver the intervention, and what should administering and delivering the intervention cost? However, the potential gain of decreased externalizing behavior problems is well worth the effort.

Although the potential for early peer interventions to affect adolescent association with deviant peers requires further empirical testing, the current data on deviant peers are quite clear: association with deviant peers during adolescence is a significant causal risk factor for antisocial behavior. Grouping similarly deviant adolescents together, even in the presence of therapeutic interventions, serves only to maintain and possibly enhance antisocial behavior. This finding is in direct conflict with many educational, community, and state policies and services that group troubled youth together in classrooms or in group homes. Clearly, these policies deserve re-examination given these research findings. Also, there needs to be more research that examines alternatives to group placement (e.g., therapeutic foster care) and that addresses ways of preventing association with deviant peers during pre- and early adolescence (e.g., after-school programs, increased parental monitoring).

In looking over the research on peer rejection, victimization, and enhancement of aggressive

behavior, it is not clear how these three forms of peer influence interact or mutually develop over time. Although research indicates that rejected and aggressive children are more likely to be victimized in grade school, it is not clear whether these children are also at risk for victimization during adolescence. Also, how does early victimization affect peer acceptance and the formation of social cliques? Are there developmental events, child characteristics, or family influences that increase vulnerability to peer influence and, therefore, could be used to more effectively target preventive interventions? Some of the fundamental peer processes involved in the development of externalizing behavior problems have been established; research is needed that pursues more complex interactions and the developmental timing of peer influences from early childhood through adolescence.

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Table 3. Peer Influences—Research Summaries

Authors	Year	Design	Representativeness	Size	Age ^a	% Male	SES ^{**}	Ethnicity	Result	Key Statistics
Bierman, Smoot, & Aumiller	1993	Concurrent group comparisons	Convenience: selected 4 groups of children from rural sample of 415; aggressive, rejected, aggressive-rejected, & comparison	95	1/2, 3/4, 5/6 gr 6.4–13 yrs	100%	"Mixed"	96% Cauc 4% N/R	Elementary school boys rated by their peers as both aggressive & rejected had higher teacher, peer, & observer ratings of argumentative-disruptive behavior (verbal aggression, hyperactivity, rule violations, & disruptiveness) than boys who were rejected only, aggressive only, or nonproblematic. All 3 problem groups had lower peer & teacher ratings of prosocial behavior than nonproblematic boys.	Argumentative-Disruptive $F(3, 84) = 16.45, p < .001$ $M = .86^a$ aggressive-rejected $M = -.35^b$ aggressive $M = -.12^b$ rejected $M = -.58^b$ comparison Prosocial Behavior $F(3, 84) = 44.31, p < .001$ $M = -.65^a$ aggressive-rejected $M = -.45^a$ aggressive $M = -.39^a$ rejected $M = 1.14^a$ comparison (M 's with different superscripts differ $p < .05$) (ANOVAS)
Bierman & Wargo	1995	Prospective longitudinal 2 yrs	Convenience: followup study of 95 schoolchildren selected from sample of 415 students in rural area; included aggressive, rejected, aggressive-rejected, & comparison children	81	1/2, 3/4, 5/6 > 3/4 5/6, 7/8 gr 6.4–13 > 8.6–14.8 yrs	100%	"Mixed"	96% Cauc 4% N/R	Elementary school boys rejected by peers as aggressive-rejected exhibited a maladaptive developmental trajectory over 2 yrs; they continued to be rated as more aggressive & hyperactive-disruptive by peers & teachers than comparison children, taking into account T1 behavioral differences, & were also less preferred by peers. Rejected or aggressive children had a more normalizing trajectory; on most T2 measures they resembled comparison children, although aggressive children continued to be more disruptive.	Agg/Rej Group Time 1 & Behavior Time 2 Aggression $F(3, 69) = 16.30, p < .05$ Disruptive-hyperactive $F(3, 69) = 18.34, p < .05$ Social preference $F(3, 69) = 7.45, p < .05$ (p 's = ns: Group $\times$ Grade, grade & interactions) (ANCOVA, control for T1 behavior differences, means & post hoc tests not reported) No Problem at Time 2 $\chi^2(9) = 24.83, p < .01$ 28% aggressive-rejected 58% aggressive 46% rejected 83% comparison (chi-square)
Cole, Terry, et al.	1995	Prospective longitudinal 8 yrs T1: 3rd grade T2–T4: 6th, 8th, 10th	Convenience: stratified random sample from 1,147 3rd graders from 28 classrooms in 12 schools, Durham, NC; selected according to peer nominations of aggression & rejection	407	3rd > 6th, 8th, 10th gr	50%	Low–lower middle	100% AFA	Self-reported externalizing behavior increased from grade 6 to grade 10 for boys nominated as rejected & aggressive by 3rd-grade peers, but not for aggressive, rejected, or nonproblematic boys. 6th-grade intercepts did not differ across group. For girls, 6th-grade externalizing was higher for aggressive girls, & was consistent from 6th to 10th grades. Analyses of parent reports found that externalizing was higher for rejected than nonrejected boys. Aggressive boys showed an increase in externalizing from 6th to 10th grades, while nonaggressive boys showed a decrease.	Boys, Self-Report $F(1, 477) = 4.12, p < .04$ $\eta^2 = 6.40$ nonaggressive, aggressive $\beta = 1.53$ rejected-aggressive $\beta = -.12$ all others Girls, Self-Report $F(1, 477) = 6.04, p < .01$ $\eta^2 = 4.95$ nonagg, 7.37 aggressive Boys, Parent-Report $F(1, 473) = 8.48, p < .004$ $\eta^2 = 15.4$ nonrejected, 19.4 rejected $F(1, 473) = 4.55, p < .03$ $\eta^2 = -1.09$ nonagg, .51 aggressive (growth curve analysis, mixed model ANOVA)

^a > Indicates that data at first age are used to predict data at second age.
^{**} Unless otherwise indicated, income is reported in yearly amounts.

Peer Influences—Peer Rejection

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Conduct Problems Prevention Research Group	1999	Intervention random assignment Fast Track IV: during 1st gr	Convenience: selected children who were at risk based on teacher & parent ratings of behavior; schools in high-risk areas (crime & poverty) Durham, NC; Nashville, TN; rural central PA, & Seattle, WA; schools at each site matched on demographics & randomly assigned to IV (191 classrooms) or control (210 classrooms)	891	spring K > summer 1st gr	69%	Low-middle 35% low Hollingshead	51% AFA 47% Cau 2% Other (Hisp, Pac Is)	Children in the Fast Track* preventive intervention showed intervention effects in the areas of aggressive-disruptive behavior, social cognition, & peer relations. The intervention group spent more time in positive peer interactions, had higher peer social preference scores, higher parent & teacher ratings of behavior change, less observed aggression at school, greater improvement in social problem solving, & greater reductions in aggressive retaliation than children in the control group. *Fast Track IV: (1) universal school-based interventions designed to teach emotional, friendship, self-control, & social problem-solving skills and; (2) selected interventions including parent groups, child social skills groups, academic tutoring, home visits, child peer pairing, & parent-child sharing.	Child: Observed Aggression, School $d = .31$, $F(356) = 8.76$, $p < .004$ $M's = 1.95$ IV, 1.92 control Child: Behavior Change, Parent $d = .50$, $F(245) = 15.55$, $p < .0001$ $M's = 1.33$ IV, 1.00 control Child: Behavior Change, Teacher $d = .53$, $F(244) = 17.38$, $p < .0001$ $M's = 1.62$ IV, 1.37 control Social Cognition: Social Problem Solving $d = .33$, $F(1, 359) = 9.61$, $p < .002$ $M's = .61$ K, $.70$ gr 1 IV, $.63$ K, $.67$ gr 1 ctrl Social Cognition: Aggressive Retaliation $d = .23$, $F(1, 359) = 4.57$, $p < .04$ $M's = .43$ K, $.31$ gr 1 IV, $.42$ K, $.35$ gr 1 ctrl Peer: Positive Peer Interaction $d = .27$, $F(356) = 6.10$, $p < .02$ $M's = .50$ IV, $.46$ control Peer: Peer Social Preference $d = .28$, $F(356) = 6.38$, $p < .02$ $M's = -.47$ IV, $-.63$ control (ANOVAs)
Duhoon, Duncan, et al.	1994	Concurrent correlational	Convenience: recruited students from schools in at-risk (low SES & high delinquency rates) neighborhood	374	1st & 5th gr	48%	Low-middle 76% low 29% public assistance	84% Cau 16% N/R	Coercive child-parent & child-peer interactions were associated with each other & with higher parent & teacher ratings of antisocial behavior.	Coercive Interactions & Antisocial Behavior $\chi^2(24, N = 380) = 33.0$, $p = .08$, CFI = .98 $\beta's = .21$ boys, $.22$ girls child-peer $\beta's = .37$ boys, $.34$ girls child-parent $\beta's = .19$ b & g, child-peer, child-parent ($p's < .05$, structural equation model)
Lodman, Cole, et al.	1993	Intervention random assignment 1-yr followup spr 3rd gr screen 4th gr IV spr 4th post spr 5th followup	Convenience: recruited 3rd graders from 28 classrooms, inner-city school system; selected peer-rated rejected children from pool of 602 students; 4 groups: aggressive/rejected IV & controls, & rejected IV & controls	52 T1 44 F-up	3rd > 5th gr	52%	Low-middle	100% AFA	Boys rated by their peers as aggressive & rejected (AR) who took part in a school-based social relations intervention had lower teacher ratings of aggression & rejection, & higher peer ratings of social acceptance post-intervention than children in the control group. At 1-yr followup, AR children in the intervention group continued to have lower teacher ratings of aggression than AR controls, & received higher teacher ratings for prosocial behavior. Children who were rejected but not aggressive showed no intervention effects post-intervention or at followup.	Rejection, Post-IV, Teacher Ratings $t(17) = 2.81$, $p < .01$ rejection $M's = 3.21$ AR IV, 4.18 AR ctrl Aggression, Post-IV, Teacher Ratings $t(17) = 2.12$, $p < .04$ aggression $M's = 1.53$ AR IV, 3.15 AR ctrl Social Acceptance, Post-IV, Peer Ratings $t(17) = 2.23$, $p < .04$ acceptance $M's = -.57$ AR IV, -1.55 AR ctrl Aggression, 1-yr Followup, Teacher Ratings $t(12) = 2.41$, $p < .03$ aggression $M's = 2.69$ AR IV, 3.98 AR ctrl Prosocial, 1-yr Followup, Teacher Ratings $t(12) = 2.05$, $p < .05$ prosocial $M's = 3.32$ AR IV, 2.40 AR ctrl ($p's < .05$, all IV = outcome $F's$) (ANOVAs, covariate: pre-intervention scores)

Peer Influences—Peer Rejection

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Lochman & Wayland	1994	Prospective longitudinal 4 yrs	Convenience: subsample of boys from 8 rural, suburban, & urban elementary schools in Durham, NC; boys rated by peers as agg & random sample of nonagg boys were selected from pool of 624 students, randomly assigned to bc or ctrl, present sample part of (n = 273) ctrl group	114	M = 11 > 15 yrs 4th–6th > 7th–10th gr	100%	Low middle middle 29% prof 29% semiprof 42% un- & skilled labor	26% AfrA 74% CauC	Peer-rated low social status & aggression in 4th–6th grade predicted higher composite externalizing scores (teacher/ peer/observer ratings) 4 years later. Self-reports of crimes against persons were predicted by higher composite peer-rated aggression but not social status.	Externalizing Behavior, Other Report r^2 (65) = .53 aggression, .38 low social $R^2 = .331$ $\beta = .07, p < .001$ aggression $\beta = 1.35, p < .05$ social status ($p = ns$: race) Crimes Against Persons, Self-Report r (65) = .23 aggression $R^2 = .058, \beta = .009, p < .05$ aggression (p 's = ns: race, social status) (both models, p 's = ns: all interactions) (stepwise multiple regressions)
Schwartz et al., 1997: see "Family Characteristics, Conflict-Discipline"										
Crick, Casas, & Ku	1999	Concurrent group comparisons	Convenience: recruited children & teachers from 9 classrooms in 3 preschools, moderate- size Midwestern town	129	M = 4.5 yrs	52%	N/R	44% AfrA 10% AsiA 44% CauC 2% Other	Preschoolers who experienced relational (ignored, left out) or physical (hit, pushed, called names) victimization were more rejected by peers than nonvictims. Children who experienced relational victimization were also less accepted by peers than other children. Relational victimization accounted for variance in boys' & girls' acceptance scores, & in boys' & younger children's (3.1–4.6 vs. 4.7–5.6 yrs) rejection scores, controlling for physical victimization. Analyses were based on peer reports.	Relational Victimization, Peer Rejection F (1, 114) = 6.02, $p < .05$ M 's = -.08 nonvictim, .63 victim Relational Victimization, Peer Acceptance F (1, 114) = 5.04, $p < .05$ M 's = .08 nonvictim, -.58 victim Physical Victimization, Peer Rejection F (1, 114) = 4.27, $p < .05$ M 's = -.08 nonvictim, .41 victim Controlling Physical Victimization p 's < .05, M 's victim > nonvictim: peer acceptance; peer rejection, boys & peer rejection, younger child (see study for r 's and means) (ANOVAs, univariate & by gender, grade)
Crick & Grotpeter	1996	Concurrent group comparisons	Convenience: students from 4 public schools in moderate-size Midwestern town	474	3rd–6th gr	52%	Low–lower middle	38% AfrA 60% CauC 2% Other	Rejected children (according to peer nominations) reported more relational* victimization than popular, average, neglected, or controversial children & more overt** victimization than popular or controversial children. Rejected children also received fewer prosocial acts than popular children. *relational victimization: threat/harm by peers to peer relationships, left out, gossiped, or lied about ** overt victimization: threat/harm to physical well-being; hit, pushed, hair pulled	Treatment by Peers & Status Multivariate F (12, 921) = 3.0, $p < .001$ Relational victimization F (4, 350) = 7.2, $p < .001$ M 's = 2.69* rejected, 2.39* average, 1.94* pop, 2.11* neglect, 2.03* contro Overt victimization F (4, 350) = 2.5, $p < .05$ M 's = 2.54* rejected M 's = 2.03* popular, 2.01* contro Target of prosocial acts F (4, 350) = 3.3, $p < .01$ M 's = 3.08* rejected, 3.54* popular (M 's w/different superscripts, differ $p < .05$) (MANOVA, ANOVA, Student Newman-Keuls)

Peer Influences—Peer Victimization

Peer Attribution	Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Dodge		1980	Concurrent group comparisons	Source specific: selected boys rated by teachers highest on aggression & by peers lowest on liking (rejected) & matched by race sample rated lowest on aggression & highest on prosocial behavior; semi-rural school	90	2nd, 4th, 6th gr	100%	Low-middle	33% AFA 67% Cau	Aggressive boys exposed to frustrating negative outcomes in a laboratory situation reacted with more retaliatory aggression than nonaggressive boys when peer intentions were ambiguous; responses to benign or hostile intentions did not differ. Boys responding to hypothetical negative outcomes with ambiguous peer intentions were more likely to attribute hostile intention & retaliate aggressively toward aggressive than nonaggressive instigators.	Behavior, Agg Status, Intention, Retaliation $F(2, 72) = 2.64, p < .08$ (agg $\times$ intent) $F(1, 72) = 6.56, p < .03$ aggression $M's = 2.3^a$ agg, 1.5 ^a nonagg, ambiguous $M's = 1.8^a$ agg, 1.7 ^a nonagg; benign $M's = 2.7^a$ agg, 2.5 ^a nonagg; hostile (ANOVA, Newman-Keuls post hoc) Hypothetical Situation, Attributions of Hostile Intent, & Status of Peer Target $F(1, 84) = 46.51, p < .0001$ Aggressive subjects $M's = 1.40$ agg peers, 1.10 nonagg Nonaggressive subjects $M's = 1.31$ agg peers, 1.03 nonagg Hypothetical Situation, Retaliation $F(1, 84) = 19.37, p < .0001$ Aggressive subjects $M's = 1.48$ agg peers, 1.31 nonagg Nonaggressive subjects $M's = 1.39$ agg peers, 1.20 nonagg (ANOVAs)
Dodge & Frame		1982	Concurrent group comparisons	Source specific: studies 1 & 2, recruited boys rated by peers & teachers high on aggression, low on prosocial/liking, & matched (race & classroom) non-aggressive/prosocial peers; 2 public elementary schools	81 study 1 80 study 2	K-5th gr	100%	N/R	80% Cau 20% "minority"	Boys attributed more hostile intentions for instigating the same outcomes & indicated more aggressive retaliation toward aggressive than nonaggressive peers. In a replication study, children were more likely to indicate that boys labeled aggressive would commit a future hostile act than boys labeled popular or not labeled. Aggressive boys who were the target of negative or ambiguous story outcomes attributed more hostility to the instigator than nonaggressive boys, although there were no differences when the outcome was directed at another peer. Aggressive boys indicated more aggressive retaliation to stories than nonaggressive boys.	Study 1: Hostile Attributions About Agg $F(1, 75) = 4.46, p < .04$ $M's = 1.48$ agg, 1.38 nonagg Study 1: Aggressive Retaliation on Boys $F(1, 75) = 7.42, p < .01$ $M's = 1.32$ agg, 1.26 nonagg Study 1: Aggressive Retaliation by Agg $F(1, 75) = 3.20, p < .08$ $M's = 1.34$ agg, 1.23 nonagg Study 1: Agg Status & Hostile Attribution $F(1, 75) = 6.51, p < .02$ Aggs $M = 1.52$ agg, self-directed Aggs $M = 1.37$ nonagg, other directed Aggs $M = 1.43$ agg, other directed Aggs $M = 1.43$ nonagg, other directed Study 2: Future Hostile Acts, Agg Status $F(2, 148) = 61.75, p < .001$ $M's = .59$ agg, .35 no label, .20 pop Aggs = approximate $M's$ from figure (ANOVA, Newman-Keuls post hoc)

Peer Influences—Peer Victimization

Author	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Dodge & Frame	1982	Concurrent group comparisons; data collected 8 times over 2-wk period; T1 not used to predict T2	Convenience: study 3, recruited volunteers from 8 schools in small Midwestern town	48	2nd gr	100%	Low-middle	90% Cauc 10% N/R	Aggressive boys initiated & received more acts of physical or verbal provocation/aggression than average or nonaggressive boys. Overall, aggressive boys initiated more aggressive acts than they were victims of, while average & nonaggressive boys received more aggressive acts than they initiated. Analyses were based on classroom observations.	Study 3: Agg Status by Initiator on Agg $F(2, 34) = 2.95, p < .05$ (agg = initiate) $F(2, 45) = 6.93, p < .01$ (agg = aggression) Aggressive boys, verbal aggression 28.3 initiate, 19.2 receive, +48% Aggressive boys, physical aggression 4.3 initiate, 3.6 receive, +19% Average boys, verbal aggression 17.7 initiate, 18.3 receive, -4% Average boys, physical aggression 1.9 initiate, 2.1 receive, -10% Nonaggressive boys, verbal aggression 7.5 initiate, 9.1 receive, -18% Nonaggressive boys, physical aggression 1.7 initiate, 2.7 receive, -37% (ANOVAS)

Perry, Kusel, & Perry	1988	Prospective longitudinal 3 mths	Convenience: children from university school in middle-class school district	165	3rd-6th gr	50%	Middle	N/R	Peer-rated victimization (verbal & physical) was associated with more peer-rated rejection & less peer-rated acceptance. Rejected children had higher victimization scores than children rated by their peers as popular, neglected, average, or controversial.	Victimization & Rejection, Acceptance $r^2 = .57$ reject, $-.36$ accept, $p^2 < .001$ Status & Victimization $F(4, 93) = 8.31, p < .001$ $M = 171.2$ rejected $M = 52.9$ neglected $M = 46.7$ controversial $M = 39.6$ average $M = 25.8$ popular (ANOVA, t tests, r^2 's not reported, $p^2 < .05$)
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Victimization & Criminal Offending

Esbensen & Huizinga	1991	Retrospective group comparisons prevalence, past year, & lifetime	Population: recruited youth from households with 7, 9, 11, 13, & 15 yr olds; stratified probability sample from socially disorganized high-crime neighborhoods; Denver, CO; Denver Youth Survey	877	11, 13, & 15 yrs	100%	Low	33% AfrA 10% Cauc 45% Hip 12% Other (AsiA, NaziA) (includes 7 & 9 yr olds)	Self-reports of lifetime personal (assault) and/or property (theft) victimization were higher for youths reporting a history of delinquency (minor & felony assault, theft, alcohol & marijuana use, & drug sales) than for nondelinquent youth. The likelihood of victimization increased with increases in the variety & number of delinquent behaviors. Among youth victimized in the past year, those involved in delinquent activities reported higher rates of personal or property victimization in the past year than did nondelinquent youths.	Lifetime Prevalence of Personal & Property Victimization & Delinquency 24%, 35% no delinquent acts 37%, 44% 1 type of delinquent act 45%, 48% 2 types of delinquent acts 51%, 67% 3-5 types of delinquent acts 68%, 69% ≥ 6 types of delinquent acts (order of %: personal, property victim) (chi-squares not reported, $p^2 < .001$) Last Year Frequency Personal Victimization $M^2 = 1.74$ nondel, 3.03 delinquent Last Year Frequency Property Victimization $M^2 = 1.95$ nondel, 3.40 delinquent (ANOVA, F 's not reported, $p^2 < .05$)
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Peer Influences—Peer Victimization Victimization & Criminal Offending

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Sampson & Laubman	1990	Concurrent Replication correlations	Population: randomly selected an age 16+ person from households in 238 (1982) & 300 (1984) electoral districts, England & Wales, for a national representative sample; British Crime Survey	21,935 (10,905 1982 11,030 1984)	16+ yrs	N/R	Low	2% Afr 95% Cau 3% Other	Risk of self-reported personal & household victimization (assault, theft, or vandalism) was related to self-reported offending (violence, theft, or vandalism), area crime rate, male gender, & age, taking into account college education, single marital status, & lifestyle (drinking behavior & number of nights out per week). In a modified replication study, risk of victimization was related to minor self-reported deviance, taking into account the above- mentioned variables.
Key Statistics									
1982 Cohort: Victimization & Offending									
$\chi^2 (8) = 395.01$									
$\beta = .25, p < .001$ offending									
$\beta = .43, p < .001$ high crime									
$\beta = .23, p < .01$ male									
$\beta = -.02, p < .001$ age									
(p 's = ns: college education, drinking, nights out, single)									
1984 Coh: Victimization & Minor Deviance									
$\chi^2 (8) = 369.46$									
$\beta = .21, p < .05$ minor deviance									
$\beta = .12, p < .001$ high crime									
$\beta = .26, p < .01$ male									
$\beta = -.03, p < .001$ age									
$\beta = -.37, p < .001$ single									
$\beta = .06, p < .01$ nights out									
(p 's = ns: college education) (logistic regression analyses)									

Self-Reported Assault & Victimization
 $\chi^2 (12) = 10.65, p = .56$
 $r = .77^{**}$ victimization
 $r = .63^{**}$ gang membership
 $r = .48^{**}$ weapon use
Adult Arrest Record
68% victim, 27% nonvictim
(logit model; *Goodman's coefficient
of multiple determination)

The probability of committing
a serious assault was related to
retrospective reports of victimization
(confined here to serious assault
with a weapon—shooting or stabbing),
gang membership, & weapon use.
Victims were more likely to have
an adult arrest record than
nonvictims.

N/R% Afr
N/R% Cau

Low-middle

100%

26

567

Convenience:
randomly sampled
10% of participants
from earlier study of
males born in 1945,
Philadelphia, PA

1986 Retrospective
correlational
26-yr recollection

Singer

Peer Enhancement—Peer Selection

Caime, Caime, et al.	1988	Concurrent group comparisons	Convenience/ Source specific: recruited 695 children from 4 elementary & 3 middle schools in suburban & rural areas of 2 counties, selected 40 children rated as highly aggressive by school personnel & nonaggressive controls matched on gender, race, SES, age, size, & classroom	80	4th & 7th gr	50%	Low-upper $M = 30.9$ (7-80) Duncan scale	75% Cau 25% "Minority" (mostly Afr)	Highly aggressive children & nonaggressive matched controls (based on school personnel ratings) were equally distributed among nuclear, secondary, peripheral, & isolated status in social clusters. Aggressive children did not differ on peer's judgment of isolation or number of times chosen as a reciprocal best friend, although they were rated by teachers as less popular than controls. Ratings of aggression were similar for best friend boys in 4th & 7th grade, 7th-grade girls, & 7th-grade nonreciprocal boy best friends.
Key Statistics									
Social Cluster Analysis									
30% aggr, 35% ctrl nuclear									
45% aggr, control secondary									
20% aggr, control peripheral									
5% aggr, 0% ctrl isolated									
Peer Isolation: 10% aggr, 8% ctrl									
Reciprocal Best Friend: 43% aggr, ctrl									
(chi-squares not reported, p 's = ns)									
Popularity, Teacher Ratings									
$F (1, 36) = 21.08, p < .001$									
M 's = 4.12 aggr, 2.73 nonagg 4th boys									
M 's = 4.32 aggr, 3.03 nonagg 4th girls									
M 's = 4.23 aggr, 3.73 nonagg 7th boys									
M 's = 4.53 aggr, 3.13 nonagg 7th girls									
Best Friend Aggressiveness									
$r = .51, p < .01$ reciprocal 4th boys									
$r = .63, p < .01$ reciprocal 7th boys									
$r = .51, p < .01$ reciprocal 7th girls									
$r = .40, p < .01$ nonreciprocal 7th boys									
(ANOVA, correlations)									

Peer Influences—Peer Enhancement

Peer Selection

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Farver	1996	Concurrent group comparisons	Convenience: recruited preschool children from 4 classrooms, 1 school in low-income, ethnically diverse area of large West Coast city	84	4 yrs	50%	Low	45% Cau 55% Hisp	Highly aggressive preschool children were rated by teachers as having more reciprocal friendships than less aggressive children but fewer friendships than children who were rated as nonaggressive. Aggressive preschoolers were members of social cliques with children observed to have similar levels of aggression. Nuclear members of social cliques had more observed aggression than peripheral, secondary, or isolated members.	Aggression & Reciprocal Friends $\chi^2(4) = 18.75, p = .000$ No reciprocal friends 1% no agg, 8% few, 6% many One reciprocal friend 2% no agg, 12% few, 28% many More than 2 reciprocal friends 20% no agg, 14% few, 8% many (aggressive incidents: few 1-4, many > 7) Aggression Within 12 Cliques $r^2 = .73$ to .98, $p's < .001$ -.05 (9 cliques) $r^2 = .50$, .54, .59, $p's = ns$ (3 girl cliques) Aggression by Clique Status, Sex $F(4, 63) = 6.54, p = .00$ $M's = 2$ Nuc; 1.8 Sec; 1.6 Isol; 1.5 Periph (chi-square, correlations, ANOVA)
Gordano, Cernkovich, & Pugh	1986	Concurrent group comparisons	Population: youth from private households, large north central SMSA,* multisource modified probability sampling stratified by race, average housing value, then by gender & race	884	12-19 yrs	49%	Low-middle	53% Afr 47% Cau	There were no significant differences in self-reported friendship stability (average length of time being friends) for nonoffenders, low & high frequency minor offenders, & low & high frequency major offenders, controlling for age. * SMSA: American Standard Metropolitan Statistical Area	Stability of Friendships $p = .54, p = ns$ $M = 4.75$ nonoffender $M = 5.54$ low-frequency minor del $M = 5.42$ high-frequency minor del $M = 5.52$ low-frequency major del $M = 5.37$ high-frequency major del (ANCOVA, age controlled)
Haiselager, Hartup, et al.	1995	Concurrent group comparisons	Convenience: recruited children from 102 classes, 51 elementary & 8 special education schools in the Netherlands; included target child, 1 mutual same-sex friend, & 1 nonfriend of target	576	4th-8th gr	50%	Low-middle	90% Cau 10% Other* (Dutch) *could include Afr, Asn, Hise	Friends were more similar than nonfriends & boys were more similar than girls on classmates' ratings of antisocial behavior (starts fights, disrupts, & bullies). Friends showed more similarity for antisocial behaviors than prosocial behaviors, shyness/dependency, or sociometric measures. Friends did not differ from nonfriends on ratings of social acceptance.	Fights $F(1, 188) = 9.73, p < .01$ $M's = .28$ girls, .76 boys friends $M's = .43$ girls, 1.09 boys nonfriends Disrupts $F(1, 188) = 7.22, p < .01$ $M's = .37$ girls, .86 boys friends $M's = .50$ girls, 1.15 boys nonfriends Bullies $F(1, 188) = 6.14, p < .01$ $M's = .24$ girls, .80 boys friends $M's = .33$ girls, 1.07 boys nonfriends (gender $p's < .001$, social accept $p's = ns$) (2 = 2 = 2 ANOVA on difference scores)
Kupermidt, Burchinal, & Patterson	1995	Prospective longitudinal 4 yrs	Convenience: recruited all 2nd-4th graders in school system, small southern city, 62% of population sampled	880	3rd-4th > 5th-7th gr	48%	Low-N/R 40% Low 60% N/R	39% Afr 61% Cau	Students rated by peers as having an aggressive best friend, high rates of conflict with this friend, or who were rejected by peers were at greater risk for delinquency 4 yrs later (teacher or self-reports).	Cumulative Risk Model: Delinquency $\beta = .31, p < .001$ peer rejection $\beta = .27, p < .001$ conflict with friend $\beta = .21, p < .001$ aggressive friend (backward logistic regression analysis)

Peer Influences—Peer Enhancement

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Tremblay, Masse, et al.	1995	Concurrent correlational cross-sectional sequential; data collected over 3 yrs; T1 not used to predict T3	Population: recruited boys in 53 public schools, low-SES areas, Montreal, Canada; boys who had Canadian-born, French-speaking parents & a mutual friend were eligible	1,034	10, 11, & 12 yrs	100%	Low	100% Cau (French Canadian)	Peer ratings of aggression were similar for boys & their friends at ages 10, 11, & 12. Boys & friends' likeability at ages 10, 11, & 12 were taken into account.	Boys & Friends' Aggressiveness $\beta = .158, p < .05$ age 10 $\beta = .266, p < .05$ age 11 $\beta = .268, p < .05$ age 12 (structural equation model)
Associative Pairing										
Krueger, Moffitt, et al.	1998	Concurrent correlational	Convenience: recruited at age 21 from Dunedin study participants & their partners of 6 mths or more; original sample: consecutive births, spring, 1972–1973, Dunedin, New Zealand	350 couples	21 yrs	50%	N/R	N/R% Cau; N(%) Pac. Is	Intimate partners at age 21 had similar self-reports of antisocial behavior, including variety of offenses & peers' delinquency. They also had similar attitudes about the consequences of crime.	Assortative Mating & Antisocial Behavior $r = .54, AGFI = .90$ variety of offenses $r = .54, AGFI = .90$ peers' delinquency Assortative Mating & Attitudes $r = .21, AGFI = .91$ rise of being caught $r = .20, AGFI = .97$ sanctioned by job $r = .41, AGFI = .99$ sanctioned by partner $r = .38, AGFI = .99$ sanctioned by family $r = .42, AGFI = .79$ sanctioned by friends $r =$ assortative mating coefficient AGFI = adjusted goodness of fit index (confirmatory factor analytic models)
Quinton, Pickles, et al.	1993	Prospective longitudinal 15 yrs approximate	Convenience: 4 samples, (1) young adults reared in children's homes, (2) quasi-random low-SES comparison group, (3) random pop sample of 10 yr olds, (4) children high on behavioral deviance, all from inner-city London	150–352	$M = 10.5$ yrs T1	47%	Low	N/R	A supportive nondeviant partner at age 21 interrupted the continuity between conduct disorder in childhood (measures) & teacher & retrospective self-reports at age 10 & adult criminal convictions. Childhood conduct disorder (retrospective report) & deviant peers increased the risk of having a 1st partner who was deviant.	Continuity of Conduct Disorder & Partner $\chi^2(2) = 10.44, p < .005$ ($n = 150$) $M = 00.0$ with nondeviant partner $M = 17.7$ without nondeviant partner (latent class models) First Cohabitation With Deviant Partner Conduct disorder ($n = 352$) OR = 1.67, CI = 1.1–2.5, Wald $p = .01$ Deviant peers OR = 2.72, CI = 1.3–5.3, Wald $p = .007$ (Cox proportional hazards model)
Yamaguchi & Kandel	1993	Retrospective correlational lifetime reports	Convenience: recruited 50% of participants in earlier study & their partners, married or cohabiting; 1st recruited as 10th–11th graders, 18 public high schools, NY, 1971–1972	545 dyads	26–31 yrs cohort 19–60 yrs partners	50%	N/R	N/R	There was moderate concordance between partners on measures of illicit drug use over the lifetime, prior to marriage & in the past 12 mths for adults who had used a class of drug 10 or more times. Latent trait log-linear models controlling for population heterogeneity indicated that this concordance was due to assortative mating, not socialization.	Concordance of Drug Behavior, Partners $K = .34$ ever lifetime $K = .34$ ever prior marriage $K = .43$ last 12 mths (all p 's < .001) (see study for log-linear models) (weighted kappa)

Peer Influences—Peer Enhancement Peer Reinforcement

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Snyder & Brown	1983	Prospective longitudinal 6 wks	Source specific: recruited children rated 5 highest & lowest on conduct disorder scale from day care center in Kansas	20	3–5 yrs	50%	Low $M = \$11k$ income/yr	50% Cau 50% "Minority"	Oppositional children observed in a day care setting were more likely than children rated by teachers as nonoppositional to initiate oppositional behavior (respond aversively to a positive antecedent); reciprocal opposi- tional behavior (respond aver- sively to aversive consequences) & continue aversive behavior once begun. Oppositional children were also more likely to receive aversive stimuli.	Initials: Positive Antecedent $U = 2, p < .001$; $P = .07$ opp, .02 non $Z = -4.5$ opp, 1.1 nonopp $p < .001$ Reciprocal: Aversive Antecedent $U = 13, p < .001$; $P = .37$ opp, .27 non $Z = 23.9$ opp, 24.9 nonopp $p < .001$ Continue: Oppositional at T + 2 $U = 5, p < .001$ T opp $Z = 24.6$ opp, 19.4 nonopp $p < .001$ $P = .611$ opp, .378 nonopp $T + 1$ opp $P = .389$ opp, .526 nonopp aversive $P = .681$ opp, .000 nonopp $T + 2$ $P =$ conditional probability, behavior/antecedent (Mann-Whitney U tests)
Snyder, Horson, & Childs	1997	Prospective longitudinal 4 mths	Convenience: recruited from 4 preschool classrooms, high-crime area, Denver, CO	72	49–62 mths	50%	Low poverty	100% AYA	Aggressive behavior increased over a 4-mth period for children who associated a substantial amount (teacher ratings & observations) or a moderate amount (teacher ratings) of time with aggressive peers.	Aggression, Teacher Ratings $F(2, 69) = 13.50, p < .001$ Agnr M 's = 1.12, 1.40 substantial > 30% Agnr M 's = 0.70, 1.00 moderate 15–30% Aggression, Observed $F(2, 69) = 5.02, p < .01$ Agnr M 's = 0.70, 1.1 substantial > 30% Agnr = approximate M 's T1 & T2 from figure (ANOVAS)
Bullying Farrington	1993	Prospective longitudinal 5, 18 yrs	Population: sampled boys ages 8–9 yrs from 6 state primary & 1 social ed school in working- class area of London, 1961–1962; Cambridge Study in Delinquent Development	378	14 > 18–19 yrs, 32 yrs	100%	Low 23% < 4.15 30% > 4.20 income/week	90% Cau < 10% W Ind < 10% Crypt	Bullying at age 14 predicted bullying at age 32, independent of aggression at 14 or 32. Self-reports of bullying at age 32 were almost twice as likely for boys who had reported bullying at age 14, & almost 3 times as likely for boys who reported bullying at 18. Men who reported bullying at age 32 were over 2 times more likely to have been convicted of a violent crime.	Aggression & Bullying at Ages 14 & 32 Likelihood ratio $\chi^2 = 4.9, p = .014$ (controls: aggression T1, T2, & T1 x T2) Bullying Age 14 & Bullying Age 32 OR = 1.90, $\chi^2 = 4.50, p = .017$ Bullying Age 18 & Bullying Age 32 OR = 4.83, $\chi^2 = 28.3, p = .0001$ Bullying Age 32 & Violent Crimes by 32 OR = 2.18, $\chi^2 = 4.31, p = .019$ (logistic regressions)
O'Connell, Pepler, & Craig	1999	Concurrent group comparisons, comparisons 120 hrs video- tape, 2 times a yr over 3 yrs; 53 of 185 bullying segments were based on self, peer, or teacher narra- tives; included focal bully & 2 or more peers	Convenience: recruited from 2 preschools, Toronto, Canada area; male/ female stratified sample of bullies, victims, bully-victims, & companion-children; based on self, peer, or teacher narra- tives; included focal bully & 2 or more peers	219 children 53 segments	5–12 yrs	N/R	N/R	N/R	Victims of playground behaviors showed peers' influence on bullying; the duration of a bullying episode increased as the number of peers present increased; peers actively & passively reinforced bullying episodes, & peers intervened in bullying episodes. Older boys were more likely than older girls or younger boys to join the bully, while younger & older girls were more likely to support the victim than older boys.	Peers Present & Bullying Duration $r = .23, p < .05$ Reinforcement: 21% active, 54% passive Peers & Intervention 25.4% Gender, Grade on Bullying $F(1, 120) = 6.5, p < .02$ Agnr M 's = 17 vs. 36 ob, 25 vs. 10 og Gender, Grade on Victim Support $F(1, 120) = 4.7, p < .04$ Agnr M 's = 28 vs. 11 ob, 26 vs. 34 og $Y =$ younger, $O =$ older, $B =$ boys, $G =$ girls Agnr = approximate M 's from figures (correlations, ANOVAS)

Peer Influences—Peer Enhancement

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Chamberlin & Reid	1998	Intervention random assignment 1 yr followup	Source specific: chronic delinquents referred by juvenile justice system for community placement, metro area of mid-sized Pacific NW city	79	12–17 yrs	100%	N/R	8% Afr 85% Cau 6% Hisp 3% NHA	Boys who participated in multidimensional tx foster care (MTFC) showed a greater reduction in rate of official criminal referrals & report less delinquency, index offenses, & felony assaults in the year following treatment than boys who received group care (GC). Participation in MTFC predicted official referral rate, self-reported delinquency, index offenses, & felony assaults, even after accounting for age of first offense, age at baseline, & pre-treatment offense rates.	Rate of Official Criminal Referrals $F(1, 77) = 3.93, p = .003$ group $\times$ time $R^2 = .19, \beta = -.21, t = -3.22, p = .002$ tx $M's = 8.5, 2.6$ MTFC, 6.7, 5.5 GC Delinquency, Self-Report $F(1, 77) = 6.50, p = .01$ $R^2 = .24, \beta = -.23, t = -2.14, p = .04$ tx $M's = 12.8$ MTFC, 28.9 GC Index Offenses, Self-Report $F(1, 77) = 5.3, p = .03$ $R^2 = .15, \beta = -.23, t = -2.05, p = .04$ tx $M's = 2.2$ MTFC, 8.6 GC Felony Assaults, Self-Report $F(1, 77) = 4.10, p = .05$ $R^2 = .20, \beta = -.27, t = -2.33, p = .02$ tx $M's = 1.2$ MTFC, 2.7 GC (regression, step 1: age 1st criminal referral, step 2: age at baseline, step 3: pretreatment criminal referral rate, step 4: treatment group) (ANOVA, hierarchical multiple regression)
Dishion & Andrews	1995	Intervention random assignment 1 yr followup 4 tx groups (family, peer, family & peer, self-directed) & 1 quasi-expt-mental control	Convenience: self-referred families recruited through ads, flyers, & community professionals; eligible at-risk children had at least 4 out of 10 possible risk factors; Adolescent Transitions Program	158	6th–8th gr	53%	Low 46% = \$15–420k 2 50%	95% Cau 5% Other	Adolescents who participated in an intervention that aggregated high-risk youth showed increased externalizing behavior according to reports at 1-yr followup compared to controls. Adolescents in a parent-focused intervention showed a decrease in externalizing post-tx compared to controls. Dishion, McCord, & Poulin (1999) (see below) report that iatrogenic effects for teacher reports of delinquency were found at 1st, 2nd, & 3rd year followups.	Externalizing, Teacher Report Post-tx $F(1, 125) = 3.44, p < .06$ $M's = 13.3$ pre, 12.2 post, parent 1 yr followup $F(1, 125) = 3.94, p < .05$ Post hoc $F(1, 125) = 4.29, p < .05$ $M's = 10.5$ pre, 13.1 post, teen group $M's = 10.5, 11.3, p < .10$ parent & teen Delinquency, Teacher Report 1-yr FU aprx $M's = 3.8$ teen, 2.3 control 2-yr FU aprx $M's = 3.3$ teen, 2.1 control 3-yr FU aprx $M's = 4.2$ teen, 2.6 control aprx = approximate means from figure (covariate baseline externalizing) (ANCOVAs, $F's$ for delinquency not reported)
Dishion, Eddy, et al.	1997	Prospective longitudinal 8–9 yrs T1: discipline & antisocial behavior T2–4: deviancy training & violence	Population: recruited from 2 birth cohorts of 4th grade boys attending randomly selected school in 10 neighborhoods with highest delinquency rates, metro area, midsize OR city, Oregon Youth Study	194	9–10 > 13–18 yrs	100%	Low-middle 20% receive aid T1	N/R% Cau N/R% Other (predominantly Caucasian)	Adolescent peer deviancy training* (ages 13–18) predicted police contact for violent arrests & self-reported violence, controlling for childhood antisocial behavior (child/parent/teacher reports) & childhood parental coercive discipline (observed). *Peer deviancy training: the average duration of rule-breaking talk during videotaped interactions with 1 of 3 peers child spends most of his or her time with, measured at ages 13/14, 15/16, 17/18.	Peer Deviancy Training & Violence Police contact, violent arrests $\chi^2(191) = 176.9, p = .76$ $\beta = .78, OR = 2.14$ ($p's$ = ns, child antisocial behavior, discipline) (logistic regression analysis) Violence, Self-report Multiple $R^2 = .57$ $R^2 = .32, F = 31.02, p < .001$ $\beta = .28$ peer deviancy training $\beta = .44$ child antisocial behavior (p = ns, parental discipline) (multiple regression analyses)

Peer Influences—Peer Enhancement Deviant Peers

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Dishion, McCord, & Poulin	1999	Intervention random assignment; 5.5 yrs of tx pairs matched on aggression, family stability, family hx crime & substance abuse, acceptance of authority, parent discipline	Convenience: analyzed data from Cambridge-Somerville Youth Study; matched pairs of boys from high-crime & impoverished areas of eastern MA; tx 1936-1939 to 1945; 40 yr followup	250	M = 10.5 M = 47 yrs	100%	Low	N/R	Boys sent to summer camp for more than 1 summer as part of a 5.5-yr treatment intervention had a 10:1 risk of having an undesirable outcome (defined as being convicted of a serious crime, dying by age 35, or being diagnosed with alcoholism or a psychiatric illness), compared to untreated matched peers. see Dishion & Andrews, 1995, for Adolescent Transitions Program results.	Risk Ratio—Bad Outcomes 1. never attend summer camp 1. attend 1 summer (n = 59) 10 attend 2+ summers (n = 66) (The treatment intervention focused on boys' counseling with a social worker (M = 2 yr/mo), but could also include academic tutoring, family assistance, medical & psychiatric care, encouragement to join community groups, & recreational activities.) (no statistics reported)
Elliott, Huizinga, & Menard	1989	Prospective longitudinal 1 yr 1976-1977 replication 1977-1978	Population: probability sample of U.S. households, representative of 11-17 yr olds according to U.S. Census Bureau; National Youth Survey	1,725	13-18 > 14-19 yrs	50% approx	Low-upper	N/R% A/R% Cauc N/R% Other	Delinquent peer group bonding & gender (male) predicted level of self-reported general delinquency & index offending, taking into account SES, age, race, cohort size, rural-urban residence, occupational & school strain, internal bonding (family, school, & belief), & external bonding (family & school involvement). *Results were replicated the following year. *variables included in analyses (see study for β 's for male gender) (path analysis, OLS regression)	General Delinquency Offending $R^2 = .31$, 1977 analyses $\beta = .505$, day = .27 deviant peers $R^2 = .21$, 1978 analyses $\beta = .515$, day = .27 deviant peers Index Offending Rates $R^2 = .15$, 1977 analyses $\beta = .344$, day = .13 deviant peers $R^2 = .14$, 1978 analyses $\beta = .334$, day = .12 deviant peers day = directly attributable variance
Keenan, Loeber, et al.	1995	Prospective longitudinal/concurrent correlational	Convenience/ Source specific: randomized sample recruited from inner-city public schools, Pittsburgh, PA; 1/2 high risk for behavior problems, 1/2 randomly selected from remainder	1,014	4th & 7th gr	100%	Low-middle M = 36.5 Hollingshead	57% A/R 43% Cauc	Boys who reported that all or most of their peers had conflicts with authority were twice as likely to have conflicts with authority themselves. Similarly, boys with peers involved in overt or covert delinquency were 3 & 4 times more likely to also be involved. Predictive findings indicate that boys previously exposed to peers engaged in authority conflicts were 1.5 times more likely to have conflicts with authorities later on, while boys previously exposed to peers who engaged in overt or covert delinquency were twice as likely to engage in either one of these behaviors. Effects remained after accounting for parental supervision, parental warmth, & grade.	Concurrent, Peers, Conflict With Authority $\chi^2 = 38.33$, $p < .001$ $\beta = .80$, OR = 2.2, $p = .000$ Concurrent, Peers, Covert Behavior $\chi^2 = 112.30$, $p < .001$ $\beta = 1.45$, OR = 4.3, $p = .000$ Predictive, Peers, Conflict With Authority $\chi^2 = 19.79$, $p < .001$ $\beta = .35$, OR = 1.4, $p < .05$ peers $\beta = .31$, OR = 1.4, $p < .05$ supervision $\beta = .40$, OR = 1.5, $p < .05$ warmth Predictive, Peers, Covert Behavior $\chi^2 = 81.9$ $\beta = .70$, OR = 2.0, $p = .00$ peers $\beta = .68$, OR = 2.0, $p = .00$ grade $\beta = .36$, OR = 1.4, $p = .065$ supervision Predictive, Peers, Overt Behavior $\chi^2 = 10.20$, $p < .05$ $\beta = .60$, OR = 1.8, $p = .006$ peers (logistic regressions)

Peer Influences—Peer Enhancement Deviant Peers

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Patterson	1993	Prospective longitudinal 4 yrs	Population: recruited 4th grade boys from 11 randomly selected schools in low-SES areas, neighborhoods with high delinquency rates, metro area of midsize NW city	206	4th > 8th gr	100%	Low-middle	N/R	Initial level of antisocial behavior in grade 4 (intercept, parent/child/self-report) was associated with ineffective parental discipline & monitoring. Growth in antisocial behavior from 4th to 8th grade (slope) was related to increased deviant peer involvement & wandering. Deviant peer involvement continued to predict increased antisocial behavior, after controlling for wandering.	Parenting & Antisocial Behavior $\chi^2 (2, N = 201) = 25.2, p = .29, CFI = .995$ $R^2 = .58, .71, .73, .76$ (4th, 6th, 7th, & 8th grades) Intercept, antisocial behavior $R^2 = .35$ for monitor/discipline β 's = $-.31$ monitor, $-.44$ discipline 4th gr Slope, antisocial behavior $R^2 = .43$ for deviant peer, wandering β 's = $-.44$ deviant peer change 4th-6th gr β 's = $-.31$ wandering change 4th-6th gr (latent growth model)
Vitaro, Tremblay, et al.	1997	Prospective longitudinal 1.5 yrs	Population: boys in 53 public schools in low-SES area, Montreal, Canada, were rated by kindergarten teachers; eligible boys had Canadian-born, French-speaking parents with < 15 yrs ed	868	11-12 > 13 yrs	100%	Low $M = 10.5$ yrs parent ed	100% Cauc (French Canadian)	Moderately disruptive (MD) boys (teacher ratings) with aggressive-disruptive (AD) friends reported more delinquency 1.5 yrs later than MD boys with average, nonaggressive, nondisruptive, or no friends, taking into account previous delinquency & parental occupational prestige. AD friends reported similar rates of delinquency as highly disruptive boys, controlling for parent occupational prestige. Highly disruptive boys had high levels of delinquency, regardless of their friends' level of aggressiveness.	Moderately Disruptive Boys & Friends $F (3, 129) = 3.28, p = .01$ $M = 34.9$ aggressive-disruptive $M = 31.5$ average $M = 31.2$ nonaggressive $M = 32.1$ no friends Highly Disruptive Boys & Friends $F (3, 127) < 1.00, p = ns$ (covariates: previous delinquency, parental occupational prestige) Moderate vs. Highly Disruptive Boys $F (1, 170) = 1.28, p = ns$ (covariate: parental occupational prestige) (ANCOVA, post hoc test not reported)
Gangs Bjerrgaard & Smith	1993	Concurrent group comparisons data collected at 2 points, 6 mths apart; T1 not used to predict T2	Population: recruited from all 7th & 8th graders in public schools, Rochester, NY; oversampled high-risk youth (male, high-crime areas)	960	13-15.5 yrs	73%	N/R	68% Afri 15% Cauc 17% Hisp	Male & female adolescent gang members reported higher prevalence & incidence rates of serious, moderate, & minor delinquency than adolescents who were not affiliated with a gang. Male gang members reported higher prevalence & incidence of serious delinquency & higher incidence of moderate & minor delinquency than female gang members.	Serious Delinquency—Incidence (#) M 's = 3.7 gf, 6.6 mf, 6.5 gm, .03 nm Serious—Prevalence, % (#) M 's = 67 gf, 6.6 mf, 82 gm, 11 nm Moderate Delinquency—Incidence (#) M 's = 6.2 gf, .1 mf, 14 gm, 2.9 nm Moderate Delinquency—Prevalence (%) M 's = 68 gf, 32 mf, 76 gm, 38 nm Minor Delinquency—Incidence (#) M 's = 11 gf, 2.6 mf, 22 gm, 3.2 nm Minor Delinquency—Prevalence (%) M 's = 65 gf, 38 mf, 72.7 gm, 36 nm g = gang, n = nongang, f = female, m = male (*m > f, gang vs. nongang, p 's < .05) (no other statistics reported)

Peer Influences—Peer Enhancement

Gangs	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Ebersole & Huizinga	1993	Prospective longitudinal 4 yrs	Population: recruited from households with age 7, 9, 11, 13, 15 youth; stratified probability sample from socially disorganized high- crime neighborhoods; Denver, CO; Denver Youth Survey	799- 1,134	7, 9, 11, 13, 15 yrs > up to 4 yrs	52%	N/R	33% AfA 10% CauC 45% Hisp 12% Other (AsnA, NatA)	Prevalence of street & serious offending and individual rates of offending were higher during active gang membership than prior to joining or after leaving a gang. Rates of offending were higher for gang than nongang members before, during, & after active gang membership.	Prevalence, Street Offenses Gang members during yr 3 only Yr 1 .43 gang, .13 nongang ($n = 799$) Yr 2 .55 gang, .14 nongang ($n = 765$) Yr 3 .90 gang, .15 nongang ($n = 1,091$) Yr 4 .77 gang, .15 nongang ($n = 1,056$) (chi-square, gang vs. nongang, all p 's < .05) Individual, street offending—Yr 3 Yr 1 13.9 gang, 2.0 nongang Yr 2 20.9 gang, 2.0 nongang Yr 3 34.5 gang, 5.7 nongang Yr 4 22.9 gang, 4.2 nongang (see study for additional results) (t tests, gang vs. nongang, all p 's < .05; temporal tests were not conducted)

Thornberry, Krohn, et al.	1993	Prospective longitudinal 42 mths 6-mth intervals, waves 2-7	Population: recruited from all 7th & 8th graders in public schools, Rochester, NY; over- sampled high-risk youth (male, high- crime areas)	987	8th & 9th 9 th fall > 10th & 11th 9 th spring	100%	Low-upper	64% AfA 18% CauC 18% Hisp (T1)	Transient (1 yr) & stable (2 or more yrs) gang members reported more general delinquency & crimes against persons while active gang members. Stable gang members reported higher rates of delinquency than transient & nongang members before, during, & after active status but reported more crimes against persons only while active members of the gang. Transient gang members reported more delinquency & crimes against persons than nongang members only when an active gang member. Crimes against property showed no consistent cross-time or cross-group differences.	General Delinquency Transient ($n = 53$) vs. nongang Cross-time: p 's = .01, .003, ns Cross-group: p 's = .002, .047, ns Stable T1 & T2 ($n = 24$) vs. nongang Cross-time: p 's = ns, .001, .08 Cross-group: p 's = .002, .047, ns M 's = 4.7, 3.7, 5.1 nongang M 's = 18.9, 7.7, 6.8 transient M 's = 26.7, 37, 13.3 stable Crimes Against Persons Transient vs. nongang members Cross-time: p 's = .007, .003, ns Cross-group: p 's = .001, ns, ns Stable T1 & T2 vs. nongang members Cross-time: p 's = ns, .004, .001 Cross-group: p 's = .002, .001, ns M 's = 2.7, 2.3, 3.4 nongang M 's = 13.4, 5.6, 5.1 transient M 's = 17.3, 12.6, 3.7 stable *order of p 's, cross-time T1 vs. T2, T2 vs. T3, T2 vs. T3 **order of p 's, cross-group: T1, T2, T3 (see study for additional results) (t tests)
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Broader Social Environment, Communities, and Schools

Research on the impact of community and broader social environmental factors differs from research discussed in other areas of this report in several fundamental ways. First, many of the community and social environmental features that elevate risk for externalizing behavior problems operate in a cluster. That is, while one can statistically identify distinct factors (e.g., minority group membership, economic disadvantage), in reality, risk of youth conduct problems is particularly elevated in social areas characterized by a confluence of these structural features.

Second, in the other sections of this report, assessments of risk are associated with individual variation in externalizing behavior problems and conduct problems. However, research examining the influence of community and broader social environment factors traditionally has focused on rates of violence and crime across particular geographic entities rather than on individual variation. For example, neighborhoods characterized by high rates of unemployment often have a high overall crime rate. These variables may not be strong in predicting which youth will exhibit externalizing behavior problems. However, the "strain" associated with the inability to achieve along traditional educational and occupational lines may be an important contextual factor influencing antisocial behavior.

Broader Social Environment

Within the broader social environment, two key factors have been related to aggression and delinquent behavior—culture and SES. Indeed, it can be very difficult to distinguish the effects of these two factors because SES is frequently confounded with ethnic membership. As noted above, it may be the interaction of culture and SES that is most germane to youth conduct problems. Given this caveat, cross-cultural research on aggression and violence has shown American culture to be more accepting of aggressive behavior (Hartz, 1995; Kumagai & Straus, 1983) compared with other cultures. This can be particularly striking within some U.S. subcultural groups (Heimer, 1997), such as street gangs (Bjerregaard & Smith, 1993; Esbensen & Huizinga, 1993; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993). Research on lower SES and poverty consistently shows these variables to correlate with elevated rates of crime (Heimer, 1997). Rates of crime are likely to increase where there is a decline in access to jobs or where unemployment is high (Almgren, Guest, Immerwahr, & Spittel, 1998; Catalano, Novaco, & McConnell, 1997).

Economic discrimination also is associated with increased violence (Messner, 1989). In the criminal justice system, lower SES and minority youth were

more likely to be referred to court and to receive more intensive police scrutiny than higher SES and Caucasian youth (Sampson, 1986).

Communities and Neighborhoods

Studying the impact of communities and neighborhoods on children, researchers have examined three major features: (1) structural and demographic features, (2) exposure to situations or events, and (3) community-level processes and forms of social control. In terms of structural and demographic features, research on the extent to which neighborhoods are characterized by deteriorating housing (Spelman, 1993), overcrowding (Wallace, 1990), greater population density, and greater numbers of female-headed households (Harries & Powell, 1994; Smith & Jarjoura, 1988) consistently shows correlations with neighborhood crime rates and violence.

Children and young people who live in deteriorating neighborhoods with higher crime rates are more likely to be exposed to and witness robberies, assaults, and murders. Experiencing their neighborhood as dangerous, young people may become anxious, depressed, defiant, and/or aggressive (Aneshensel & Sucoff, 1996; Gorman-Smith & Tolan, 1998; Greenberg, Lengua, Coie, & Pinderhughes, 1999; Griffin, Scheier, Botvin, Diaz, & Miller, 1999). Children who have seen or been the victim of violence are more likely to perceive themselves as vulnerable to violence and are more likely to report carrying weapons to school (Simon, Dent, & Sussman, 1997; Uehara, Chalmers, Jenkins, & Shakoor, 1996).

A newer line of research has begun to examine how community-level processes and forms of social control may be related to youth delinquency. Studies have shown that the extent of collective social control (e.g., the extent to which members of the community have local friendship networks and

share collective willingness to intervene in youth misbehavior, such as skipping school, painting graffiti, showing disrespect to adults) correlates with decreased rates of delinquency and problem behaviors and partially mediates the relationship between community structure variables and delinquency (Bursik & Grasmick, 1993; Elliott et al., 1996; Sampson, 1997; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997).

Social Environment and Community Influences on Families and Children

Another strategy for assessing the impact of the broader social environment and community is to examine how these broader contextual factors influence group and individual processes (e.g., family, peer, or child individual characteristics). The basic notion is that structural or demographic variables—such as SES, culture, and community deterioration—probably influence everyday social routines and ways of relating, which may in turn affect the risk of antisocial behavior.

Compared with lower-SES parents, those in middle-class families are more likely to monitor their children's friendships and less likely to use harsh discipline (Heimer, 1997); both are parenting behaviors shown to be causal risk factors for child externalizing behavior problems (see Family Factors and Processes section). Additional research has documented that higher levels of perceived economic stress are associated with parental distress, which in turn increases parental hostility, decreases parental monitoring, and subsequently increases youth externalizing behavior (Conger et al., 1992). Other research has documented differences between children of middle-SES families and children of lower-SES families; middle-SES children show less physical aggression and more cooperative interactions with peers (Ramsey, 1988).

Schools

Recently, incidents of school violence have drawn people's attention to the nature of schools and the identification of educational policies, educational practices, and student behavior that can contribute to child and youth conduct problems and violence. It is important to note that the majority of youth who receive any help for a mental health problem receive interventions through their school (Burns et al., 1995). However, such services tend to be brief (approximately one visit per quarter for outpatient or three days for inpatient) and are more typical for younger children (Farmer, Stangl, Burns, Costello, & Angold, 1999).

A number of school policies may affect youth conduct. These policies include zero-tolerance practices (the suspension and expulsion of students for problem behaviors), proficiency testing (requiring students to pass standardized exams to qualify for graduation), full inclusion (providing uniform services in the general classroom regardless of the intensity of the problem), and use of the social maladjustment clause of the federal definition of students with serious emotional disturbance, which indicates that students who are socially maladjusted are not eligible for special education services and civil rights protections unless it is determined that they have an emotional disturbance. Little systematic research, however, has examined how these school policies affect youth conduct. Limited research examining the impact of the social maladjustment clause indicates that this policy may be extremely difficult to apply appropriately. Current rating scales for discriminating between social maladjustment and emotional disturbances have been found to be unreliable (Costenbader & Buntaine, 1999). Similarly, research on teacher assessments of those in need of special education services has shown that while students with externalizing behavior problems are deemed troubled, many are not identified for special education services (Farmer,

Rodkin, Pearl, & Acker, 1999). However, in another study, boys recommended for special services showed higher rates of conduct disorder than boys who were referred but not recommended (Mattison, Morales, & Bauer, 1992). This unreliability and lack of clear identification can have profound implications under the social maladjustment clause. By not identifying children with externalizing behavior problems as emotionally disturbed, schools are able to suspend and expel these children without invoking any of the civil rights protection practices that are required for students with identified disabilities.

Even when children are identified as emotionally disturbed, the impact of placement into special classrooms is difficult to assess. Placement into special services is governed by legal mandates, and students placed in more restrictive settings are expected to have more intensive needs than those placed in less restrictive settings. Thus, special placements cannot be experimentally manipulated, and studies comparing outcomes of students in different settings must be conducted with nonequivalent groups. Given these limitations, research indicates that interventions designed to decrease disruptive classroom behavior do result in desired outcomes in both special services classrooms and typical classrooms, with children in restricted classrooms more likely to evidence reduction in disruptive behavior than students in regular classrooms (Stage & Quiroz, 1997). Interestingly, interventions designed to prevent school dropout found that correlated reductions in conduct problems in youth ages 9, 10, and 11 also helped to prevent placement in special classrooms, which in turn reduced the risk of dropping out of school (Vitaro, Brendgen, & Tremblay, 1999). Cumulatively, these results suggest that special classroom placement supplemented with interventions to reduce disruptive behavior may be effective. However, it is not clear whether these effects are similar for children and youth in elementary, middle, and high school or whether

prevention of special classroom placement may be even more effective.

Changing schools frequently is associated with a variety of problems, including lower academic performance, worse behavior in school, lower grade retention, school dropout, and serious disciplinary problems (Rumberger & Larson, 1998; Swanson & Schneider, 1999; Tucker, Marx, & Long, 1998). Based on data collected by the National Educational Longitudinal Survey, changes that occur during the early school years have little impact on child behavior problems. However, school changes during high school were correlated with a moderate increase in behavioral problems (Swanson & Schneider, 1999). The importance of number of school changes may be mediated by family structure. In families with two biological parents, excessive mobility (eight or more moves) correlated with school problems. However, for all other family configurations, any move was associated with problematic youth behavior (Tucker et al., 1998). Also, school changes and dropout were predicted by high rates of absenteeism, misbehavior, and low-educational expectations (Rumberger & Larson, 1998).

Another school variable considered relevant to child conduct is the type of disciplinary practices invoked for misbehavior. Although disciplinary practices are aimed at reducing problem behavior in schools, surprisingly few studies have directly examined the relationships between school discipline and the development and maintenance of externalizing behavior problems. Given the growing trend of adopting zero-tolerance policies, this lack of data is cause for concern. In a survey on school suspension, the majority of middle school and high school students who received suspensions did not consider this form of discipline to be very helpful in solving problems (Costenbader & Markson, 1998). Data on less punitive forms of school discipline also are limited. However, there is some evidence that use of less punitive forms of school discipline in elementary school (e.g.,

reminders to be safe and respectful) did result in reduced problem behavior (Lewis, Sugai, & Colvin, 1998).

Another school practice that has received attention is tracking (i.e., the arrangement of students in classrooms by levels of ability). Tracking is a complex factor, as it is intertwined with other characteristics of students, families, friends, and schools in ways that seem to solidify differences among students. Students who come from low-SES backgrounds, attend low-SES schools, are members of ethnic-minority groups (Jones, Vanfossen, & Ensminger, 1995), and display behavior problems (Farmer, 1993) are over-represented among low-ability tracks. Being placed in a low-ability track is associated with less effective instruction, more disruptive off-task behavior by students, and lower than expected academic attainment (Gamoran, Nystrand, Berends, & LePore, 1995).

Public concerns about class and school size have grown with concerns about violence in the schools and poor pupil performance. Yet educational researchers have had difficulty determining whether reduced class size positively affects student performance and behavior. Part of this difficulty comes from the fact that schools do not randomly assign students to classes (e.g., there is tracking) and that there are state and federal regulations that limit the size of special education classes. However, when special education restrictions are taken into account, smaller class size does correlate with enhanced performance (Akerhielm, 1995). Research on the size of schools has focused on academic outcomes rather than behavioral outcomes (Lee & Smith, 1997; McGiverin, Gilman, & Tillitski, 1989). This research indicates that the most effective high schools serve 600–900 students. Neither small schools (< 300) nor large schools (> 2,100) are associated with strong learning environments. Similarly, the effect of school size is more profound in schools with lower-SES students and in schools with higher concentrations of minority students (Lee & Smith,

1997). It is not known, however, whether these same effects would be useful indicators of student behavior and conduct.

Within schools, youth develop social hierarchies and groups that, in some cases, can set the tone for conduct problems and delinquency. Students in high-status cliques can wield considerable social power with peers and classmates. Recent research has shown that aggressive behavior by boys can enhance the likelihood of their obtaining prominent positions in social structures (Xie, Cairns, & Cairns, 1999), particularly when accompanied by high athleticism or above-average academic performance (Rodkin, Farmer, Pearl, & Van Acker, 2000). Additional research, however, is needed to understand how social cliques and hierarchies develop and contribute to student conduct in schools.

Two features of the classroom also have been related to child externalizing behavior problems—the level of classroom disruption/aggression and teacher-student interactions. One study has documented that the overall level of classroom aggression can have significant effects on individual children's risk for aggression over time (Kellam, Ling, Merisca, Brown, & Ialongo, 1998). More aggressive boys who were assigned to first grade classrooms that were high in disruption and aggression were at markedly increased risk for continuing to be aggressive over the next years of elementary school. This was in comparison with aggressive boys who were not placed in aggressive/disruptive classrooms. In addition, recent research on teacher-student interactions indicates that teachers interact differently with students who have externalizing behavior problems. Students with behavior problems receive more teacher reprimands and fewer opportunities to respond appropriately to teacher requests (Van Acker, Grant, & Henry, 1996; Wehby, Dodge, & Valente, 1993). To some extent, lowering teacher-student ratios, particularly in special education classrooms, can mitigate these

teacher-student interactions (Thurflow, Ysseldyke, Wotruba, & Algozzine, 1993).

Complementing research on the impact of schools on children and youth is research that examines how children and youth feel about their schooling experience. "School bonding" consists of attachment to school, commitment to educational pursuits, and belief in the fairness of school rules. Evidence shows that school bonding is related to delinquency in middle school, with decreased bonding associated with increased rates of delinquency (Jenkins, 1997). Further, interventions designed to modify elementary school teaching practices to increase school bonding showed bonding to be a predictive risk factor for externalizing behavior problems in adolescence. Through an intervention designed to modify teacher behavior, successful changes in school bonding were associated with improved academic achievement (Abbott, O'Donnell, Hawkins, Hill, & Kosterman, 1998). Long-term effects of this intervention program, when combined with parent training and social competence training for the children, showed that the package of interventions provided throughout elementary school had enduring modest effects in reducing self-reported violent behavior, heavy drinking, and sexual intercourse before age 18 among multiethnic urban children (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999).

Implications for Malleable Community Risk Factors and Developmental Processes

Existing research on the broader social environment, communities, and schools indicates that many factors affect the development and likelihood of youth conduct problems. As noted at the beginning of this section, many of the social and community factors that have been associated with youth conduct problems operate in

conjunction. Lower SES, income inequality, and deteriorated housing frequently occur together and, as a cluster, are associated with high rates of crime and delinquency. However, much of this research is correlational and has focused on rates of problem behavior across geographic regions rather than individual variations in conduct. Also, social and community variables are difficult to conceptualize as "malleable" because altering income, housing, and employment opportunities would require major social change and incredible financial resources.

How then do we go about incorporating these relevant variables into developmental models for predicting and intervening with child and youth conduct problems? One strategy frequently employed by researchers is to use SES, income, violent neighborhoods, and so forth as selection criteria for determining high-risk groups and targeting interventions. This way, such social and community factors serve as contextual variables and are conceptualized as factors that potentially moderate the salience of other child, family, and peer risk factors and processes (e.g., parental monitoring, peer deviance). Although a useful strategy (it increases the probability not only that those most in need will be in the intervention but also that it will be possible to detect a change), it does little to help understand *how* such social and community factors affect conduct problems.

This question of "how" has motivated researchers interested in identifying variables that mediate the association between social and community factors and child/youth conduct problems. To date, two important sets of factors have been identified as mediators—family processes and a community process known as collective social control. Lower-SES families or families experiencing economic distress are more likely to engage in harsh discipline and provide less effective monitoring, which, in turn, partially mediates the effect of these broader variables on youth conduct problems. Similarly, the research on collective social control indicates that it partially mediates the relationship

between community disadvantage and rates of delinquency and violent crime. Although research on family processes has shown that parental monitoring and discipline are causal risk factors for child and youth conduct problems, additional research is needed on collective social control to determine its malleability and the resulting impact on youth behavior. Studying the malleability of collective social control is a critical next step that could have profound implications for indicating the causal potential of this variable and developing more effective community-level interventions to prevent youth problem behavior. Given the number of child, family, and peer processes reviewed in previous sections, it is clear that much more research is needed to examine how correlates, predictive risk factors, and causal risk factors at lower levels of analysis may either mediate or be moderated by broader social factors.

The information reviewed here about school effects on child and youth conduct problems also suggests a range of important factors. School policies, classroom placement, tracking, and classroom size all could affect youth conduct. Although many of these school variables have been related to academic success and failure, surprisingly few studies have examined these issues in relation to child and youth conduct. Those studies that have examined behavioral and conduct-related outcomes suggest that school variables do correlate with problematic behavior. However, more systematic research is needed to establish the strength of these associations and the degree to which school policies and practices predict youth behavior.

Promising research has been conducted on classroom aggression, teacher-student interactions, and school bonding. Each of these school variables has been related to child and youth conduct. In the case of classroom aggression, levels of classroom aggression in first grade reliably predicted increased aggressive behavior in later grades for children who were already showing some problem behavior. Similarly, the research on early school

bonding has shown it to reliably predict decreases in conduct problems in adolescence.

These important results need to be advanced to determine ways to modify early classroom aggression levels, improve school bonding, and evaluate the impact of these changes on child behavior. However, it is equally important that this work be integrated with research reviewed in previous sections—child characteristics, family processes, and peer factors. What are the consequences of altering early classroom aggression on child development of hostile attributions, peer rejection, and bullying? By improving school bonding, is one also influencing parental monitoring of child behavior or structuring of the learning environment? Are school-based interventions more or less effective in different neighborhood and community contexts? Clearly, many important questions remain to be investigated, questions whose answers could have enormous impact on the development of more effective preventive interventions for child and youth conduct problems.

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Table 4: Broader Social Environment, Communities, and Schools—Research Summaries

Authors	Year	Design	Representativeness	Size	Age*	% Male	SES**	Ethnicity	Result
Hertz	1995	Concurrent group comparisons	Convenience: recruited students from university lab school, Honolulu, HI; school representative of Hawaii on ethnicity, SES, & achievement	96	110h–12th gr	N/R	N/R	27% Cauc 8% FilipA 26% Japa 16% PolyA 23% Other* *excluded from analyses	High school students' ratings of parents' aggression during conflict resolution were higher for Polynesian-American than European-, Filipino-, or Japanese-American students. Students' reports of reciprocal aggression were higher for European-American families than Filipino-, Japanese-, or Polynesian-American groups.
Heimer	1997	Prospective longitudinal 3 yrs	Population: national probability sample of U.S. households, 11–17 yr olds, representative on age, sex, race, low attrition; National Youth Survey	870	11–17 yrs > 13–19 yrs	100%	Low–upper	N/R% AfrA N/R% Cauc N/R% Other	Youths' learning/acceptance of definitions favorable to violence mediated the relationship between SES (occupation, education, & income) & self-reports of violent delinquency, taking into account age, race, noncontact home, neighborhood crime, parenting in 1977, peer associations in 1978, & violence in 1977 & 1978. Low-SES youth were more likely to endorse attitudes that favored violence. Predictors of definitions favoring violence included power-assertive discipline, urban residence, 1977 aggressive friends, & 1977 violent delinquency.*
Kumagai & Straus	1983	Concurrent correlational	Convenience: recruited students: 1) Central India, 8 Catholic high schools, 2) Japan, public & private high schools in 12 rural & urban prefectures 3) United States, rural upstate NY county, central high schools	1,165 381 I 635 J 139 U	12th gr M = 14.7 I M = 17.4 J M = 16.9 U yrs old	54% 41% I 66% J 36% U	Low–upper 77% mid I 49% mid J 75% low U	33.5% India 54.5% Japan 12% U.S. (no further breakdowns)	According to youth reports, Indian, Japanese, & U.S. parents used reasoning as the primary tactic to resolve conflict, followed by verbal aggression, & then by violence. Parents' use of violent tactics was reported more frequently by U.S. than by Japanese or Indian students. U.S. students reported similar rates of violence for both parents, while Indian & Japanese students reported lower rates for mothers than fathers. Husbands & wives had high reciprocity for type of conflict tactics.

Bjorksgaard & Smith (1983), Edmerson & Hutzinger (1983), &

Thornberry et al. (1993): * see "Peer Characteristics, Gangs"

* > indicates that data at first age are used to predict data at second age.

** Unless otherwise indicated, income is reported in yearly amounts.

Key Statistics

Parent Aggression Toward Teen	
$R^2 = .28$, $F(6, 129) = 8.17$, $p < .0001$	
$F = 4.83$, $p < .05$ mothers	
$F = 4.55$, $p < .05$ Polynesian-Am parents	
$F = 10.45$, $p < .01$ PolyAm × parent (mother)	
$M's = 49.5$ PA, 20.5 EA, 10.8 JA, 28.9 FA, father	
$M's = 129.8$ PA, 31.5 EA, 11.2 JA, 26.0 FA, mother	
Teen Aggression Toward Parent	
$R^2 = .38$, $F(3, 173) = 35.43$, $p < .0001$	
$F = 101.7$, $p < .0001$ parent conflict tactics	
$F = 21.5$, $p < .0001$ CTS × EuroAm	
(means not reported; multiple regressions)	
$L^2 = 380.83$, $d^2 = 164$, AGFI = .94	
Violent delinquency 1979, $R^2 = .30$	
$\beta = .20$, $p < .01$ definitions favor violence 1978	
$\beta = .32$, $p < .01$ violent delinquency 1978	
$\beta = .11$, $p < .05$ urban residence	
(p 's = ns: SES, age, race, noncontact home, rhoad	
crime, 1977: parent supervision, discipline, &	
disapproval of aggression; 1978: aggressive friends)	
Definitions favoring violence 1978, $R^2 = .48$	
$\beta = -.17$, $p < .01$ urban residence	
$\beta = .11$, $p < .05$ power-assertive discipline 1977	
$\beta = .42$, $p < .01$ aggressive friends 1978	
$\beta = .35$, $p < .01$ violent delinquency 1978	
(p 's = ns: SES, age, race, noncontact home, rhoad	
crime, 1977: parent supervision & disapproval of aggr	
crime; 1977: parent supervision & disapproval of aggr)	
(see other Heimer entries for full model)	
(structural equation models)	
Reasoning	
$M's = 4.96$ I, 6.25 J, 9.60 U.S. husband	
$M's = 5.67$ I, 6.84 J, 11.16 U.S. wife	
$r's = .91$ I, .87 J, .83 U.S. husband-wife	
Verbal Aggression	
$M's = 2.35$ I, 3.65 J, 6.61 U.S. husband	
$M's = 2.35$ I, 5.67 J, 6.83 U.S. wife	
$r's = .77$ I, .83 J, .72 U.S. husband-wife	
Violence	
$M's = 0.80$ I, 1.37 J, 2.47 U.S. husband	
$M's = 0.42$ I, 0.67 J, 2.37 U.S. wife	
$r's = .72$ I, .76 J, .93 U.S. husband-wife	
(all r 's, p 's < .001)	
(statistical analyses on means not conducted)	

Broader Social Environment, Communities, and Schools—Broader Social Environment

Social Structure

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Sampson	1986	Concurrent/retrospective correlational retro: lifetime police contact	Population: random selection of youth from sample stratified by race, sex, official delinquency status, & SES; Seattle Youth Study	1,612	15-18 yrs	75%	Low-upper	31% AYA 69% Caut	Neighborhood SES, self-reported delinquency, & race predicted lifetime history of major police contact for adolescents in a model that included gang membership & family structure. Individual SES & delinquent peers were also significant predictors for male youth. Neighborhood SES & delinquency predicted police contact during the past year, with race & delinquent peers additional predictors for male youth. Major court referrals by police were predicted by individual SES & major police contact.

Key Statistics

Police Contacts Ever, Male Youth $R^2 = .27, p < .01$
 $\beta = -.05, p < .10$ individual SES
 $\beta = -.11$ neighborhood SES
 $\beta = .27$ serious, .14 family/school delinquency
 $\beta = .14$ delinquent peers
 $\beta = .11$ black
 Police Ever, Female Youth $R^2 = .21, p < .01$
 $\beta = -.15$ neighborhood SES
 $\beta = .25$ black
 $\beta = .15$ family/school, .28 drug/alcohol delinquency
 Major Court Referrals $R^2 = .34, p < .01$
 $\beta = -.04$ individual SES
 $\beta = .11$ male, .28 female, major police contacts
 (OLS regressions)
 Police Contact Past Year, Male Youth $\chi^2(9) = 76.8$
 $\beta = -.55$ neighborhood SES
 $\beta = .20$ serious delinquency
 $\beta = .28$ delinquent peers
 $\beta = .57$ black
 Police Contact Past Year, Female Youth $\chi^2(9) = 28.2$
 $\beta = -.156$ neighborhood SES
 $\beta = .68$ family/school delinquency
 (O's < .05 unless noted; for unreported b's, $p = ns$;
 models included family/school, drug/alcohol, & serious
 delinquency, individual & neighborhood SES, race,
 broken home, delinquent peers & gang membership)
 (logistic regressions)

Communities & Neighborhoods—Housing

Authors & Powell	Year	Pattern	Population:	Size	Age	% Male	SES	Ethnicity	Result
Harries & Powell	1994	Pattern analysis geocoding & spatial analysis	census data & police records of juvenile gun crimes, Baltimore, MD, 1980-1990	2,369 JV gun crimes	14-17 yrs offenders	98%	Low-upper locations	91.6% AYA 8.1% Caut 0.3% Other (offenders)	Spatial & temporal analyses of juvenile gun crimes between 1980 & 1990 in Baltimore, MD, found that most incidents clustered in high social stress (HSS) census tracts. Patterns varied by age, race, & location. For example, crimes by black juveniles on black victims clustered in HSS areas, particularly crimes against other juveniles; crimes on white victims occurred all over, with boundary effects along the edges of HSS areas. Crimes by white juveniles on black & white victims were committed outside of HSS areas. These patterns showed stability over time.

Juvenile Gun Crimes & High Social Stress* Tracts

- overall
- black juvenile offender, black victim
- black juvenile offender, black juvenile victim
- white juvenile offender, black victim
- white juvenile offender, white victim
- Social Stress Index: persons/occupied housing unit,
median home value, % female, % black, % under 18
(see study for spatial analyses)
(geocoding & spatial analysis)

Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistical
Smith & Jarjoura	1988	Concurrent correlational	Population: random sample of 200 households in 57 neighborhoods (defined by census blocks & police beats) from 3 SMSAs: Tampa-St. Pete, FL; St. Louis, MO; & Rochester, NY, 1977; data aggregated by neighborhood	57 neighborhoods 11,419 residents	N/R	N/R	N/R	N/R	Violent crime rates (resident reports) were predicted by the interaction of % low income (under \$5,000) & residential mobility, % single-parent households, population density, & % ages 12-20 yrs, taking into account % low income, residential mobility (main effects), % nonwhite, % living alone, racial heterogeneity, & location.	Violent Crime Rates $R^2 = .63$ $\beta = .002$, $F = 2.70$ mobility $\times$ low income $\beta = .07$, $F = 1.89$ % single-parent household $\beta = .52$, $F = 2.64$ population density $\beta = .06$, $F = 2.91$ % ages 12-20 (p 's = ns: % low income, residential mobility, city, racial heterogeneity, % nonwhite, % living alone) (see study for burglary rate results) (OLS regressions)
Snelman	1993	Concurrent group comparisons	Convenience: low-income, high-crime neighborhood, Austin, TX; blocks with abandoned residential buildings & control blocks, 2 diagonal blocks over, matched on land use & residential traffic patterns	59 blocks	N/R	N/R	Low	66% Af/A 32% Hisp 2% Other (population)	Racialized blocks with unsecured abandoned buildings (entered without force) had higher drug & property crime rates than control blocks or blocks with secured abandoned buildings. Unsecured illegally used abandoned building presence correlated with property & drug crime rates* after controlling for number of vacant buildings, physical condition of block, block location, & demographics (race/ethnicity, age, % armed/retired, & % single parents). Building type did not predict rate of violent crime.	Crime Rates Unsecured ($n = 16$) vs. Other ($n = 43$) Property crimes/block, Ratio 1.8 $F = 1.99$, $p < .05$, M 's = 5.31 case, 2.93 ctrl Drug crimes/block, Ratio 3.2 $F = 2.47$, $p < .05$, M 's = 2.69 case, 0.94 ctrl Per Block Crime Rates Property crimes $\Delta R^2 = .07$, $F(1, 57) = 4.32$, $p < .05$ Drug crimes $\Delta R^2 = .10$, $F(1, 57) = 5.36$, $p < .05$ (p 's = ns for vacancy status, building condition, block location & demographics; *rates based on calls for police service resulting in an official police report) (t tests, multiple regressions)
Wallace	1990	Concurrent correlational data from 2 time periods; T1 not used to predict T2	Population: NY City Health Dept. & census data from 62 contiguous health areas, the Bronx, NY; data from years prior to & following large population migration & pupil transfers from South-Central Bronx, 1970-1973 & 1978-1982	62 health areas	N/R	N/R	Low "poorest Congressional district"	66% Af/A or Hisp 24% N/R	Low birthweight rate (LOB) and an index of poverty & overcrowding accounted for 78% (1970-1973) & 79% (1978-1982) of the variance in number of intentional violent deaths (homicide & suicide).	Intentional Violent Deaths (IVD) 1970-1973 Adj. $R^2 = .78$ $\beta = .12$, $p = ns$ constant $\beta = .02$, $p = .000$ SES $\times$ crowding* $\beta = .02$, $p = .000$ low birthweight** Intentional Violent Deaths 1978-1982 Adj. $R^2 = .78$ $\beta = 1.59$, $p = .003$ constant $\beta = .02$, $p = .000$ SES $\times$ crowding* $\beta = .02$, $p = .000$ low birthweight** *SES (citywide SES rank) $\times$ crowding (% with over 1.51 persons/room $\times$ population/100,000); *** LOB babies/100k live births $\times$ pop/100,000 (MACROVA)

Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

Community Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Aneshensel & Scafiff	1996	Concurrent correlational	Population: 3-stage probability sample of Los Angeles County, CA—census tract, blocks, & households; screened households for 12-17-yr-old permanent residents; Latino youth over-represented; non-represented; Hispanic whites under-represented	877	12-17 yrs	54%	Low-upper Adm = \$28,750 27% poverty 26% managers	11% Afri 11% Asia 26% Cau 49% Hisp 4% Other *40% MexAm 38% Mexican 11% Salv 3% Guatem 4% Cnt/5 Am 4% Other	Adolescents who reported more ambient hazards in their neighborhood (violent crime, property damage, drug use, gangs, & graffiti) reported more symptoms of conduct disorder (CD) & oppositional defiant disorder (ODD). CD* symptoms were also associated with being male, older, & Latino, except for Latino youth in working-class Latino neighborhoods. ODD* was also associated with middle class Latino & non-Hispanic white neighborhoods. High SES, older youth, & single-parent families. Ambient hazards were highest for youth from African-American & Latino neighborhoods.
Gorman-Smith & Tolan	1998	Prospective longitudinal 1 yr	Convenience: screened youth from 17 Chicago, IL, public schools in low-SES inner-city neighborhoods; selected youth rated high risk for aggression by teachers, & random sample of remaining students; Chicago Youth Development Study	245	5th & 7th > 7th & 9th gr	100%	Low-middle 48% < 10k 74% < 20k	N/R% Afri N/R% Hisp	Exposure to violence in the past year (65% of students), family structure (mothers & sons combined ratings of family support, intolerance of antisocial values, & organization), & the interaction of exposure x family structure predicted change in aggression over 1 yr (combined child/parent/teacher ratings), taking into account exposure to other stresses, family beliefs, cohesion, parental monitoring, & discipline.
Greenberg, Lengua, et al.	1999	Prospective longitudinal 1 yr	Convenience: selected normative sample of kindergarten students based on gender, race, & teacher-rated behavior problems; high-risk schools in 1) Durham, NC 2) Nashville, TN 3) Central PA 4) Seattle, WA	337	K > 1st gr M = 6.4 yrs T1	52%	Low-middle mode = \$ Hollingshead (1 H=5 low)	43% Afri 53% Cau 4% Other % minority by location 89% NC 52% TN 1% PA 49% WA	Neighborhood risk (interviewer report of neighborhood environment, & parent report of neighborhood safety) along with SES (parental occupation), maternal depression, & family life stress predicted parent's reports of externalizing 1 yr later, controlling for family factors (family expressiveness, social support, marital distress, & home environment), maternal age, # of siblings, single-parent status, paternal education, race, & study site. Neighborhood risk, life stress, & less family expressiveness predicted teacher reports of authority acceptance.

Key Statistics

Conduct Disorder $R^2 = .11$, $F(17, 857) = 6.19$
 $\beta = .21$, $p < .001$ parent rhobod, ambient hazards
 $\beta = -.13$, $p < .05$ poverty-working class neighborhood, Lat
 $(p's < .05 - .001: Latino, age, female)$
 $ODD R^2 = .14$, $F(17, 857) = 7.84$
 $\beta = .22$, $p < .001$ parent rhobod, ambient hazards
 $\beta = -.17$, $p < .001$ working-class rhobod, Wh & Lat
 $\beta = .14$, $p < .05$ middle-class rhobod, Wh & Lat
 $(p's < .05 - .01: age, single parent, income)$
 *Models included: neighborhood clusters (SES, % Afri, % Lat); rhobod stability, perceptions of rhobod; ambient hazards & social cohesion; adolescent attitudes: same house 5+ yrs, Afri, Lat, per capita income, age, female; & family structure: intact nuclear, single parent (multiple regression)

Time 2 Aggression

$R^2 = .44$
 $\beta = .48$, $p < .001$ aggression Time 1
 $\beta = .26$, $p < .001$ exposure to violence
 $\beta = -.16$, $p < .05$ family structure
 $\beta = .14$, $p < .05$ structure x exposure
 $(p's = ns: other stressors, family beliefs, cohesion, discipline, monitoring, & all family x exposure) (hierarchical regression)$
 Exposure to Violence, Aggression by Family Structure
 $r's = .38$, $p < .001$ high fam; .13, $p = ns$ low fam (correlations)

Externalizing, Parent Report $R^2 = .26$

$\beta = .12$, $p < .05$ SES race: occupation
 $\beta = .24$, $p < .001$ family risk: life stress
 $\beta = .25$, $p < .001$ mother's depression
 $\beta = .17$, $p < .01$ neighborhood risk
 Authority Acceptance, Teacher Report $R^2 = .21$
 $\beta = .11$, $p < .05$ family risk: life stress
 $\beta = -.13$, $p < .01$ family risk: expressiveness
 $\beta = .17$, $p < .01$ neighborhood risk
 (1) demo: # sis, maternal age, single parent; (2) SES/race: education, occupation, race; (3) family: life stress, family expressiveness, social support, marital distress, home environment; (4) maternal depression; (5) neighborhood; (6) site (See study for nonsignificant $\beta's$) (stepwise multiple regressions)

Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistical
Griffith, Scheier, et al.	1999	Concurrent correlational	Convenience: recruited students from 2 New York, NY, classrooms; schools had higher % African & immigrant & lower reading level than city average	452	6th gr	51%	Low-middle 47% free lunch program	90% African 1% Caucasian 4% Hispanic 2% Native 3% Other	Self-reports of perception of neighborhood risk (gang activity & delinquency, toughness necessary in neighborhood), friends' delinquency, & less parental monitoring were associated with higher interpersonal aggression. Individual differences in risk taking partially mediated the relationship between neighborhood risk, friends' delinquency, & aggression, while anger control skills partially mediated the relationship between parental monitoring & aggression.	$\chi^2 (263, N = 452) = 708.9, p < .001, CFI = .90$ $R^2 = .47$ $\beta = .15, p < .05$ neighborhood risk—aggression $\beta = .28, p < .01$ neighborhood risk—risk taking $\beta = .21, p < .01$ risk taking—aggression $\beta = .39, p < .001$ friends' delinquency—aggression $\beta = .23, p < .01$ friends' delinquency—risk taking $\beta = .21, p < .01$ risk taking—aggression $\beta = -.15, p < .05$ parent monitoring—aggression $\beta = .30, p < .001$ parent monitoring—anger ctrl $\beta = -.16, p < .01$ anger control skills—aggression (structural equation modeling)
Simon, Dent, & Sussman	1997	Concurrent correlational	Convenience: recruited students from standard classrooms in 7 schools in 29 southern CA school districts; schools & classrooms were arbitrarily selected from a larger sample participating in a substance abuse study	504	$M = 15.6$ yrs	57%	Low-middle 84% ≥ 12 yrs old 1 parent	10% African 8% African 37% Caucasian 36% Hispanic 9% Other	Students' perceived vulnerability to victimization, peer knife or gun carrying, gang/tagging crew affiliation, & male gender increased the risk of carrying a weapon to school (25% of sample, self-report), accounting for age & type of school attended (traditional or continuation). Ethnicity, parents' education, & living arrangements were not associated with weapon carrying.	Adolescent Weapon Carrying General perceived vulnerability Adj OR = 1.79, 95% CI = 0.84 – 3.82 medium Adj OR = 3.14, 95% CI = 1.40 – 7.02 high Perceived vulnerability in school Adj OR = 0.93, 95% CI = 0.46 – 1.90 medium Adj OR = 0.55, 95% CI = 0.22 – 1.36 high Perceived vulnerability to/from school Adj OR = 0.94, 95% CI = 0.46 – 1.90 medium Adj OR = 1.58, 95% CI = 0.63 – 3.94 high Peer weapon carrying Adj OR = 2.34, 95% CI = 1.03 – 5.28 knife Adj OR = 2.11, 95% CI = 1.16 – 3.85 gun Affiliation with gangs/taggers Adj OR = 2.57, 95% CI = 1.49 – 4.43 yes (simultaneous logistic regression)
Uehara, Chalmers, et al.	1996	Retrospective correlational	Convenience: recruited students from 2 middle & 4 high schools in low-income, high-crime areas, Southside, Chicago, IL; data collected prior to students' participation in violence prevention workshop	1,035	10–19 yrs	52%	Low	100% African	Self-reports of current weapon carrying (33% of sample) were moderately associated with having ever witnessed violence (74%), been victimized (47%), or been the perpetrator (23%) of a violent crime. Male gender, older age, & school attended were also associated with self-reports of lifetime victimization or perpetration of a violent crime; 86% of perpetrators witnessed or were victims of a violent crime.	Ever Witnessed Violence (yes/no) $\phi = .26, p < .001$ current weapon carrying (ρ 's = ns for gender, age, school) Ever Victimized—Violence (yes/no) $\phi = .22, p < .001$ current weapon carrying $\phi = .21, p < .001$ school attended $\phi = .14, p < .01$ age range $\phi = .07, p < .05$ gender Ever Perpetrated—Violence (yes/no) $\phi = .37, p < .001$ current weapon carrying $\phi = .25, p < .001$ school attended $\phi = .17, p < .001$ age range $\phi = .10, p < .001$ gender (chi-square, ϕ phi coefficient)

Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Bursik & Grasmick	1993	Concurrent correlational	Population: census data & juvenile court referral records for 74 neighborhoods, Chicago, IL, 1960 & 1980	74 neighborhoods	N/R	N/R	N/R	20% AFA N/R% Other M's 1960; 40% AFA N/R% Other M's 1980	Regulatory capacity partially mediated the relationship between economic deprivation & delinquency rates for 1960 & 1980. * Economic deprivation showed direct & indirect effects, while SES showed no effects. Relationship patterns were similar across years, although the % of households with economic deprivation increased from 1960 to 1980. * Regulatory capacity: % owner occupied, residential mobility, % net migration, & % children w/ parents. Economic deprivation: % families under poverty line, public assistance/100, unemployment rate, % black residents. SES: professional pop, median ed, income	Delinquency 1960 Δ $R^2 = .66$ $\beta = .71, t = 7.87$ economic deprivation Regulatory Capacity 1960 Δ $R^2 = .69$ $\beta = -.79, t = -9.19$ economic deprivation Regulatory Capacity Mediating 1960 Δ $R^2 = .73$ $\beta = .34, t = 2.79$ economic deprivation $\beta = -.46, t = -4.23$ regulatory capacity Delinquency 1980 Δ $R^2 = .52$ $\beta = .73, t = 7.32$ economic deprivation Regulatory Capacity 1980 Δ $R^2 = .55$ $\beta = -.78, t = -8.00$ economic deprivation Regulatory Capacity Mediating 1980 Δ $R^2 = .64$ $\beta = .32, t = 2.70$ economic deprivation $\beta = -.52, t = -4.98$ regulatory capacity ($p = ns$: SES for each model) (regressions)
Elliot, Wilson, et al.	1996	Concurrent correlational	Population: Chicago; identified households with age-eligible youth in 2 census tracts: 1) high poverty: 20% under poverty line, 50+% AfrAm; 2) low poverty: med \$30k, 30+% AfrAm; Denver, CO; stratified multistage probability sample of households with age-eligible youth; census block groups (BGs)	91 neighborhoods Chicago: 58 tracts 546 hh 887 yth Denver: 33 BG 662 fam 820 yth	10, 12, 14, 16 yrs	N/R	Low-upper	Denver 15% AFA 45% Caut 21% Hsp 18% Other; Chicago 100% AFA (neighborhoods)	Informal control (aggregated parent reports of neighborhood bonding, social control, institutional control, & mutual respect) mediated the relationship between neighborhood disadvantage (SES, gender, age, family structure, length of residence) & neighborhood rates of youth problem behavior (delinquency, drug use, & arrests), prosocial behavior, & involvement with conventional friends. Neighborhood variables (informal control, social integration, & informal networks) contributed small but unique effects.	Youth Problem Behavior β 's = -.39 C rhhood disadvantage—informal control β 's = -.85 D rhhood disadvantage—informal control β 's = -.39 C informal control—problem behavior β 's = -.28 D informal control—problem behavior Youth Prosocial Competence β 's = -.39 C rhhood disadvantage—informal control β 's = -.85 D rhhood disadvantage—informal control β 's = .33 C informal control—prosocial β 's = .61 D informal control—prosocial Youth Involvement With Conventional Friends β 's = -.39 C rhhood disadvantage—informal control β 's = -.85 D rhhood disadvantage—informal control β 's = .45 C informal control—conventional friends β 's = .53 D informal control—conventional friends C = Chicago, D = Denver (p 's < .05) (p 's = ns: neighborhood disadvantage—problem behavior, prosocial competence, & conventional friends) (path analyses) Reduction in Variance, Neighborhood Effects 2% C, 1% D problem behavior 5% C, 3% D prosocial 6% C, 2% D conventional friends (hierarchical linear modeling)

Broader Social Environment, Communities, and Schools—Communities & Neighborhoods

Community-Level Processes & Social Control

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Sampson	1999	Concurrent replication correlational	Population: multistage stratified (SES, race/ethnicity) probability sample of neighborhood clusters—combined census tract areas with populations of 6,000; Human Development in Chicago Neighborhoods	3,664 residents 80 rhotid clusters	N/R	N/R	Low-upper 34% Low* 36% Mid 30% Upper *no Cauc	N/R% AfrA N/R% Cauc N/R% Hisp	Collective social control*, structural disadvantage, ethnicity/immigration, lower residential stability, & the lagged crime rate predicted adolescent delinquency, violent victimization, & 1995 homicides. Collective social control mediated the relationship between residential stability & delinquency & partially mediated the relationships between structural disadvantage, ethnicity/immigration, & delinquency. *Collective social control: perceived willingness of neighbors to intervene with juvenile truancy, graffiti, or disrespect of adults	Social Disorganization & Collective Social Control $R^2 = .56$ $\beta = -.36$ structural disadvantage $\beta = -.44$ ethnicity/immigration $\beta = .50$ residential stability Collective Social Control & Delinquency $R^2 = .75$ $\beta = -.18$ collective social control $\beta = .33$ structural disadvantage $\beta = .64$ ethnicity/immigration $\beta = .05$ lagged crime rate $\beta = -.09$ residential stability Social Disorganization & Delinquency R^2 not reported, $\beta = -.19$ residential stability (weighted least squares regressions, all p's < .05)
Sampson & Groves	1989	Concurrent replication correlational	Population: nationally representative random sample; randomly selected 1 respondent per household from 238 (1982) & 300 (1984) electoral districts, England & Wales; British Crime Survey	21,935 study 1: 10,905 study 2: 11,030	16+ yrs	N/R	N/R	N/R% AfrA N/R% Cauc N/R% East In N/R% Mixed N/R% Other	Social disorganization process variables (unsupervised peer groups & density of social friendship networks) mediated the relationship between community structural factors (SES, ethnic heterogeneity, residential mobility, urbanization, & family disruption) & self-reported rates of property (burglary & vandalism) & personal (robbery & assault) victimization. Results were replicated 2 yrs later. For 1982 data, 46% of the effect of SES was mediated by unsupervised peers.	Structure & Unsupervised Peer Groups $R^2 = .30$ 1982, $R^2 = .12$ 1984 β's = $-.34$ 1982; $-.17$ 94 SES β's = $-.13$ 1982; $-.11$, $p < .10$ 1984 ethnic heterogeneity β's = $-.22$ 1982, $p < .10$ residential stability β's = $-.22$ 1982; $-.19$ 1984 family disruption β's = $-.15$ 1982 urbanization (p's = ns; 1984 residential stability, 1984 urbanization) Structure, Social Disorganization, & Delinquency $R^2 = .21$ 1982, $R^2 = .19$ 1984 β's = $-.38$ 1982, $-.35$ 1984 unsupervised peer β's = $-.16$ 1982 & 1984 SES β's = $-.15$ 1982; $p = ns$ 1984 residential stability (p's < .05 unless noted; models: SES, residential stability, ethnic heterogeneity, family disruption, friend networks, urbanization, unsupervised peers, & in 1982, organizational participation) (MLS regressions)
Sampson, Raudenbush, & Earls	1997	Concurrent correlational	Population: census data & community survey from representative sample of residents in 343 neighborhood clusters (NCS), 847 Chicago census tracts; NCS include +/- 8,000 residents; Project in Human Development in Chicago Neighborhoods	8,782 residents 343 NCS	N/R	N/R	All	N/R% AfrA N/R% Cauc N/R% Hisp	Collective efficacy (neighborhood social cohesion & informal social control) partially mediated the relationship between neighborhood composition (disadvantage, immigrant concentrations, & residential stability) & perceived violence, violent victimization, & 1995 homicides, controlling for average homicide rates from 1968 to 1990. Collective efficacy was the strongest predictor of violence, even when social process correlates (friendship & kinship ties, neighborhood services, & organizational participation) were taken into account.	Perceived Neighborhood Violence $\beta = -.59$, $t = -5.53$ collective efficacy $\beta = .16$, $t = 6.38$ concentrated disadvantage $\beta = -.05$, $t = -3.39$ residential stability (p's = ns; immigrant concentration, prior homicide) Collective Efficacy $\beta = .28$, $t = 13.30$ concentrated disadvantage $\beta = .04$, $t = 2.44$ immigrant concentration $\beta = -.10$, $t = -6.95$ residential stability Violence Scale (All 3 Violence Measures) $\beta = -.53$, $t = -8.59$ collective efficacy (controls: prior homicide, disadvantage, immigrant, residential stability, social process correlates) (see study for victimization & homicide rate analyses) (multiple regression, no other statistics reported)

Broader Social Environment, Communities, and Schools—Social Environmental & Community Influences on Families & Children Social Status

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Conger, Conger, et al.	1992	Concurrent correlational	Convenience: recruited 7th grade students from 34 public & private schools in towns of less than 6,500 in 8 counties, north central Iowa, 1989; only families with 2 parents & a sibling within 4 yrs of age included; area had experienced recent economic decline	205	7th gr	100%	Low-middle M = \$13K 11% poverty	100% Cau	Family economic pressure mediated the relationship between economic conditions (per capita income, unstable work, & debt-to-asset ratio) & father's & mother's depressed mood. In turn, mother's depressed mood was associated with marital conflict & less maternal nurturance/involved parenting. Father's depressed mood was associated with less paternal nurturance/involved parenting. Both maternal & paternal parenting mediated the relationship between mother's/father's depressed mood & adolescent adjustment problems.
Heimer	1997	Prospective longitudinal 3 yrs	Population: national probability sample of U.S. households, 11-17 yr olds, representative on age, sex, race, low attrition; National Youth Survey	870	11-17 > 13-19 yrs	100%	Low-upper	N/8% AFA N/8% Cau N/8% Other	Lower SES parents reported greater use of power-assertive discipline, which, in turn, directly & indirectly (through aggressive friends) predicted youth definitions favorable to violence, which, in turn, predicted self-reports of violent delinquency. Lower SES parents also reported less supervision, which predicted more aggressive friends, etc. Higher SES parents were more likely to disapprove of using aggression; however, parental disapproval of aggression was not associated either directly or indirectly with violent delinquency. Lower SES youth were more likely to have aggressive friends, through more power-assertive parenting & lower supervision. Aggressive friends were associated with definitions of violence, which were predictive of violent delinquency. SES did not affect violent peers directly, but low SES was associated with violent delinquency, which predicted having aggressive friends 1 yr later.

Key Statistics

Economic Condition, Pressure, & Depressed Mood $\chi^2(53) = 70.53, p = .004, GFI = .952$ $\beta = -.47$ per capita income—family econ pressure $\beta = .14$ unstable work—family econ pressure $\beta = .25$ debt: asset ratio—family econ pressure $\beta = .59$ econ pressure—father depressed mood $\beta = .68$ econ pressure—mother depressed mood Depressed Mood, Adjustment Problems Mediated by Marital Conflict & Parenting $\chi^2(62) = 75.89, p = .11, GFI = .931$ $\beta = .48$ mother depression—marital conflict $\beta = .31$ marital conflict—mother parenting $\beta = -.47$ mother depression—mother parenting $\beta = -.48$ mother parenting—adjustment problems $\chi^2(62) = 81.57, p = .048, GFI = .945$ $\beta = -.42$ father depression—father parenting $\beta = -.46$ marital conflict—father parenting $\beta = -.53$ father parenting—adjustment problems (all p's $< .05$) (series of latent variable structural equation models)	SES & Parenting 1977 Parents' power-assertive discipline $R^2 = .15$ $\beta = -.20, p < .01$ SES $\beta = -.12, p < .05$ age $\beta = .15, p < .01$ race, black $\beta = .12, p < .05$ urban residence (p's = ns, noncontact home, neighborhood crime, violent delinquency 1977) Parents' supervision $R^2 = .07$ $\beta = .11, p < .05$ SES $\beta = -.10, p < .05$ age $\beta = -.11, p < .05$ noncontact home (p's = ns, race, urban, neighborhood crime, violent delinquency 1977) Parents' disapproval of aggression $R^2 = .04$ $\beta = .13, p < .01$ SES (p's = ns, age, race, urban, noncontact home, neighborhood crime, violent delinquency 1977) Aggressive Friends 1978 $R^2 = .15$ $\beta = -.10, p < .05$ age & race, black $\beta = .31, p < .01$ violent delinquency 1977 $\beta = .11, p < .05$ parents' power-assertive discipline 1977 $\beta = -.13, p < .01$ parents' supervision 1977 (p's = ns, SES, urban, noncontact home, neighborhood crime, parents' disapproval of aggression 1977) (see other Heimer entries for full model) (structural equation model)
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Broader Social Environment, Communities, and Schools—Social Environmental & Community Influences on Families & Children Social Status

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result
Rumsey	1988	Concurrent group comparisons	Convenience: recruited children in 3 federally funded preschools in medium-size town; ratio of children to teachers & physical facilities was similar across school types	94	3.2–5.7 yrs	50%	Low-middle 52% Low 48% Middle occupational status	100% Cau	Low-SES children responded to hypothetical social problem-solving situations with more aggressive solutions than did middle-SES children, who used more reassuring & sharing strategies. Aggression was associated with lower socioeconomic ratings for middle-SES, but not low-SES children. Low-SES children were rated lower on social competence by teachers than middle-SES children.

Key Statistics
SES & Social Strategies
 $F(1, 90) = 11.13, p < .001$ aggressive
 $M's = .76$ low, .16 middle
 $F(1, 90) = 6.64, p < .05$ reassurances
 $M's = .80$ low, 1.27 middle
 $F(1, 90) = 4.82, p < .05$ sharing
 $M's = .37$ low, .62 middle
SES & Social Competence, Teacher Ratings
 $F(1, 90) = 13.09, p < .001$ social problem solving
 $M's = 3.0$ low, 3.6 middle
(see study for results for empathy & helping)
(2 x 2 MANOVAs)

Schools—School & Community Services Integration

Burns, Costello, et al.	1995	Concurrent group comparisons	Population: recruited students from public schools in 11 mostly rural counties, western NC; 2-stage sample, children with behavior problems & 10% random sample of remaining students; Great Smoky Mountains Study of Youth	1,015	9, 11, & 13 yrs	56%	Low-middle 34% "poor" 66% "nonpoor"	9% AFA 91% Cau	16% of a sample of school-age children received services from any service sector (mental health, education, child welfare, juvenile justice, or health) in the past 3 mths. 4% were served in the specialty mental health sector. The majority of children were served, & solely served, in the education setting. 40% of children with SED (serious emotional disturbance) (diagnosis & impairment) were served, 22% in the mental health sector.
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% SED Children Receiving Services by Sector ($n = 68$)
 71.5% multiple, 46.5% sole education
 41.5% multiple, 14.3% sole mental health
 16.4% multiple, 1.2% sole child welfare
 10.9% multiple, 5.5% sole health
 4.3% multiple, 3.2% sole juvenile justice
 29.3% multiple sectors; 70.7% one sector
(see study for similar results with diagnosed only, impaired only, or nonproblem children)
(no statistics reported)

Farmer, Stangl, et al.	1999	Prospective longitudinal 1 yr	Population: recruited students from public schools in 11 mostly rural counties, western NC; 2-stage sample, children with behavior problems & 10% random sample of remaining students; Great Smoky Mountains Study of Youth	1,007	9, 11, 13 > 10, 12, 14 yrs	51%	Low-middle 27% poverty	4% AFA 93% Cau	21% of students used mental health services over the course of 1 yr, according to parent reports. Services were most likely received in an education setting & with a school counselor. Treated children averaged 3.34 contacts with any service during a 3-mth period. (Median by service: 3 days inpatient, 1.5 visits outpatient, & 0.7 contacts education services). Poverty, younger age, & # of child symptoms predicted service in an education setting, while specialty mental health service was predicted by parent psychiatric problems & # of child symptoms. Intensity of service was predicted by male gender & impact on the family. ^a
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Services Received
 12.0% education, 95% school counselor
 8.0% specialty mental health
 4.0% gen medical; 4.0% informal/nonprod
 1.4% child welfare
 0.7% juvenile justice; 0.8% out of home
 Use of Education Service $\chi^2(3) = 9.5$
 $OR = 0.77$ age (younger)
 $OR = 1.63$ poverty
 $OR = 1.20, p < .001$ # child symptoms
 Use of Specialty Mental Health $\chi^2 = 5.0$
 $OR = 1.50$ parent education
 $OR = 1.63$ poverty
 $OR = 1.20, p < .001$ # child symptoms
 Intensity/3-mth Period $\chi^2(3) = 8.6, p < .05$
 $OR = 0.41$ male
 $OR = 2.99$ impact on family
(all p 's < .05 unless noted; models include male, age, poverty, parent ed & parent psychiatric history, # child symptoms, impairment, insurance, impact, & 6x barriers)
(logistic regressions)

Broader Social Environment, Communities, and Schools—Schools

Authors	Year	Design	Representativeness	Site	Age	% Male	SES	Ethnicity	Result	Key Statistics
Cosden & Buntane	1999	Concurrent group comparisons	Source specific: recruited emotionally disturbed (ED) students in special ed facility serving 26 rural school districts, urban NY, & socially maladjusted (SM) students (1% of internal or external referrals, but no ED services) from 2 area middle schools	135	12–15 yrs	82% 94% ED 62% SM	N/R	64% Cau 11% Hisp	Two teacher rating scales were examined for their ability to discriminate between students with social maladjustment & students with emotional disturbance. The DT/CEP Scale correctly identified 21% of the ED students, & incorrectly identified 14% of SM students. In addition, 65% of ED & 61% of SM students had conduct problems. On the ESPS Scale, 2 of 5 subscales showed group differences, with lower scores for ED than SM children. Similarly, discriminant analyses found that 100% of children were classified as ED on 3 of 5 ESPS subscales.	DT/CEP Scale Emotional disturbance 14% SM, 21% ED $t = 1.84, p = ns, M's = 4.47 SM, 6.01 ED$ Conduct Problems 61% SM, 65% ED $t = 0.89, p = ns, M's = 16.75 SM, 18.37 ED$ ESPS Scale Interpersonal relations 44% SM, 65% ED $t = 2.83, p < .01, M's = 6.33 SM, 4.54 ED$ Discriminant analysis 11% SM, 89% ED Physical symptoms/needs 15% SM, 45% ED $t = 3.03, p < .01, M's = 8.83 SM, 6.88 ED$ Discriminant analysis 13% SM, 87% ED ($p's = ns$, discriminant analyses = 9% SM, 100% ED, macroscopic behavior, & unhappiness/depression) (t tests, discriminant function analyses)
Farmer, Radwin, et al.	1999	Concurrent correlational	Convenience: recruited students in 59 general ed classes that contained at least 2 students with mild disabilities attending class 1/2 day or more; included behavioral, learning, MR, speech, & hearing disabilities; schools in suburban & inner-city Chicago, & rural & small-city North Carolina	940	4th–6th gr	49%	N/R	40% AFA 54% Cau 6% Hisp	Boys with mild disabilities were over-represented in teacher-rated configurations of low academics, troubled, & extremely troubled boys, & under-represented in the model configuration. Girls with mild disabilities were over-represented in the distressed & very unruly configurations & under-represented in the model, studious, & bright antisocial configurations. Only 25% of boys & 10% of girls in the 4 antisocial configurations were disabled students.	Boys $\chi^2(6, N = 432) = 52.2, p < .0001$ Low academics $\chi^2 = 2.97, p = .08$ 18% disability, 11% no disability Troubled $\chi^2 = 9.93, p = .002$ 19% disabled, 6% not Extremely troubled $\chi^2 = 32.0, p < .0001$ 15% disability, 2% no disability Model $\chi^2 = 24.4, p < .0001$ 5% disabled, 30% not ($p's = ns$, passive, bright antisocial, & tough) Girls $\chi^2(6, N = 498) = 47.6, p < .0001$ Distressed $\chi^2 = 9.57, p < .002$ 28% disability, 9% no disability Very unruly $\chi^2 = 13.60, p < .002$ 31% disability, 9% no disability (chi-square)
Mathison, Morales, & Bauer	1992	Concurrent correlational	Source specific: consecutive referrals from school personnel for SED placement evaluations, 1982–1987; students had no prior seriously emotionally disturbed (SED) residential placements, semirural Georgia PA	170	6–11 yrs	100%	Low $M = 4/5$ Hedgingstead (1 hr–5 low)	89% Cau 11% N/R	Boys referred & recommended for SED (seriously emotionally disturbed) placement had higher rates of conduct disorder, lower adaptive functioning, and more prior therapy, & had families with lower SES, more marital disruption, greater history of psychiatric illness, more physical abuse, & more stressors compared to nonrecommended boys. 17% of educational interventions showed no differences. The strongest predictor of SED placement was CD/OD diagnosis followed by its of SES, & physical abuse, controlling for broken home & parent psychiatric illness.	Psychiatric Characteristics 33% SED, 10% non-SED, $p < .008$ CD/OD 37% SED, 17% non-SED, $p < .01$ therapy 5.28 SED, 4.60 non-SED, $p < .001$ functioning* Family Characteristics 5.00 SED, 4.50 non-SED, $p < .05$ SES* 71% SED, 53% non-SED, $p < .01$ broken home 86% SED, 72% non-SED, $p < .05$ peer play 61% SED, 41% non-SED, $p < .05$ abuse 2.40 SED, 1.80 non-SED, $p < .05$ stressors * High scores = lower functioning, lower SES Multivariate It's not reported, variables listed in order of entry $p's < .05$: CD/OD, broken home, parent psychiatric illness (logistic regression)

Broader Social Environment, Communities, and Schools—Schools

Classroom Placement

Authors Sage & Quint	Year 1997	Design Meta-analysis Intervention	Representativeness Convenience: PsychINFO search; selected studies in public school settings, with control group or baseline measures	Size 99 studies 223 effects 5,057 students	Age K-12th gr	% Male N/R	SES N/R	Ethnicity N/R% AHA N/R% Cau N/R% Other	Result On average, 76% of treated students showed reductions in disruptive classroom behavior, with students in self-contained classrooms showing greater reductions than students in regular education classrooms. Teacher ratings were less sensitive to change than behavioral observation.	Key Statistics Mean Effect Size (d_{adj}) = -.78, $sd = .58$, $N = 223$ Effect Size by Setting, Teacher Ratings, & Observed $F(2, 220) = 7.62$, $p < .001$, $f = -5.39$, $p < .05$ $ES = -.65$ regular $ES = -.86$ resource room $ES = -.97$ self-contained Effect Size by Setting, Behavioral Observation $F(2, 197) = 4.13$, $p < .05$, $f = -4.12$, $p < .05$ $ES = -.71$ regular $ES = -.97$ self-contained Effect Size by Instrument $F(1, 221) = 13.67$, $p < .001$ $ES = -.37$ teacher rating $ES = -.83$ behavioral observation (meta-analysis, ITSACORR program > f stat > effect size, ANOVA, Student Newman-Keuls t test)
Vitaro, Brendgen, & Tremblay	1999	Intervention random assignment	Population: boys in 53 public schools in low-SES area, Montreal, Canada, were rated by kindergarten teachers; only boys with Canadian-born, French-speaking parents, < 15 yrs old, eligible; at-risk boys (> 70% disruptive) took part in inter- vention; 42% not included because of parent refusal or missing data	149	6 > 17 yrs	100%	Low $M = 10.5$ yrs parent ed	100% Cau (Fr Canadian)	Participation in a dropout prevention intervention program (social skills training for boys & parent training) predicted lower average disruptiveness from ages 9 to 11, controlling for age 6 disruptive behavior, family config- uration, IQ, & parent education. Post- intervention disruptiveness mediated the relationship between program participation & non-age-appropriate regular classroom placements (non- AARC, retention, & special ed class). Less disruptiveness was associated with fewer non-AARC placements. In turn, non-AARC placements at age 12 mediated the effect of the IV program on school dropout. In both analyses, family configuration, parent education, & children's IQ were significant predictors; age 6 disruptive behavior was not. The risk of dropping out of school was 4.95 times higher for retained & 4.75 times higher for combined retained/special classroom students.	Postintervention Disruptiveness $d^2 = .07$, $p < .05$ $\beta = .20$, $p < .05$ age 6 disruptiveness $\beta = -.16$, $p < .10$ program participation $p < .05$, $M's = 8.74$ IV, 10.72 ctrl ($p's = ns$: family configuration, IQ, parent ed) Post-IV Disruptiveness Mediating IV & Non-AARC* Step 1: $\Delta d^2 = 49.72$, $p < .001$ Step 2: $\Delta d^2 = 3.25$, $p < .10$ OR = 0.44, $p < .10$ program participation Step 3: $\Delta d^2 = 9.54$, $p < .01$ OR = 0.54, $p = ns$ program participation OR = 1.13, $p < .01$ post-IV disruption Non-AARC Mediating IV & Dropout* Step 1: $\Delta d^2 = 24.56$, $p < .05$ Step 2: $\Delta d^2 = 1.89$, $p = ns$ OR = 0.43, $p < .05$ program participation Step 3: $\Delta d^2 = 1.72$, $p = ns$ ($p's = ns$: program participation, post-IV disruption) Step 4: $\Delta d^2 = 5.39$, $p < .05$ OR = 4.75, $p < .05$ non-AARC ($p's = ns$: program participation, post-IV disruption) (* $p's < .05$: family configuration, IQ, parent education, $p = ns$: age 6 disruptiveness) (hierarchical logistic regression)

Broader Social Environment, Communities, and Schools—Schools Student Mobility

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Bumbarger & Larson	1998	Prospective longitudinal 6 yrs	Population: national representative sample of students from public & private schools; National Education Longitudinal Study, NELS:88	11,671	8th gr > 12th gr	50%	N/R	N/R% Afr N/R% Asn N/R% Cau N/R% Hisp N/R% NatA	The relative odds of changing schools or dropping out of school between 8th & 12th grades were higher for students who had moved between 8th & 12th grades & who had low school engagement in 8th grade (absenteeism, misbehavior, low educational attainment), controlling for student, family, & school characteristics.*	Change Schools 8th–12th Grade OR = 1.28 high absenteeism OR = 1.22 misbehavior OR = 7.18 move OR = 0.78 grades OR = 1.28, $p < .05$ low educational expectations OR = 1.28, $p < .05$ low educational expectations (* p 's < .05: Asian, Black, Hispanic, school change by gr 8, SES, stepfamily, urban, Catholic, private, teach quality) School Dropout, 8th–12th Grade OR = 4.53 move OR = 2.53 high absenteeism OR = 1.30 misbehavior OR = 1.75 low educational expectations OR = 0.65 grades (* p 's < .05: female, Hispanic, school change/held back by grade 8, SES, stepfamily, urban, discipline, test scores) (all p 's < .01 unless noted) (logistic regressions)
Swanson & Schneider	1999	Prospective longitudinal 6 yrs	Population: national representative sample of students from public & private schools, 1980–1994; National Education Longitudinal Study	9,976–12,578	8th gr > 12th gr	50%	N/R	N/R% Afr N/R% Asn N/R% Cau N/R% Hisp N/R% NatA	Late school changing (changing schools but not residences, 10th–12th grade) was associated with greater increases in behavioral problems & lower gains in math achievement. In contrast, early moving (change of residence, not schools, grades 8–10) & early changing had no effect on behavioral problems & was associated with increased math achievement from grades 10 to 12. Students with histories of early moving, changing, or leaving (moving & changing schools) were at increased risk for early dropout. Early or late moving increased the risk of late dropout. Students who experienced early changing or leaving, however, had a decreased risk of late dropout. Early & late high school dropout were also predicted by the total number of times a student had changed schools prior to 8th grade. All analyses controlled for prior math scores & behavioral status, mobility, gender, race, family background,* & educational history.	Changes in Behavioral Problems, 10th–12th Grade Adj. $R^2 = .31$ ($n = 12,478$), $b = .19$, $p < .001$ late chgr Gains in Math Achievement, 10th–12th Grade Adj. $R^2 = .07$, $n = 9,976$ $\beta = .37$, $p < .05$ early mover $\beta = .38$, $p < .05$ changer $\beta = -.80$, $p < .05$ late changer (OLS regressions; see below for full model) High School Dropout, 8th–10th grade $\chi^2(23) = 844.2$ ($n = 12,518$) $\beta = .36$, $p < .05$ early mover $\beta = .55$, $p < .05$ early changer $\beta = .54$ late changer $\beta = .17$ # school changes prior to 8th grade High School Dropout, 10th–12th Grade $\chi^2(28) = 1,446.4$ ($n = 12,578$) $\beta = .25$ early mover $\beta = .70$ early changer $\beta = -1.15$ early leaver $\beta = .55$ late mover $\beta = .15$ # school changes prior to 8th grade (p 's < .001 unless noted) (Models included prior behavior & math scores, mobility, race, gender, GPA, behavior problems, teen parent, athletics, urban school, private school, dropout, family background, income, structure, change in composition, parent ed, ed aspirations, & ed involvement) (logistic regressions)

Broader Social Environment, Communities, and Schools—Schools

Student Mobility					
Authors	Year	Design	Representativeness	Size	Age
Tucker, Mark, & Long	1998	Concurrent/retrospective; cc: school life retro: mobility	Population: data from the National Health Interview Survey children's supplement, 1988; multistage probability cluster sampling; 4,595 of 17,000 sampled were ages 7-12, AFA or Cauç, & enrolled in elementary school; children with missing data excluded	4,178	7-12 yrs
				SES	% Male
				N/R	N/R
				Ethnicity	Result
				N/R% AFA N/R% Cauç	For students living with 2 biological parents, residential mobility did not predict caregiver reports of school problems (academic or behavioral), expect for hypermobile students, those who had moved 8 or more times by elementary school. For children in any other family structure, any move (1, 2-3, 4-5, 6-7, 8+) was associated with increased likelihood of academic or behavioral school problems. Analyses controlled for age, gender, race, mother's education, family income, # of siblings, recency & distance of last move, family type, & number of moves.
Key Statistics					
Structure Variables & Times Moved, by Family Type, Academic or Behavioral School Problems					
χ^2 = not reported					
Both biological parents					
$\beta = .34, p < .05, OR = 2.28$ 8+ moves					
All other family types					
$\beta = .21, p < .001, OR = 2.05$ 1 move					
$\beta = .18, p < .001, OR = 2.84$ 2-3 moves					
$\beta = .20, p < .001, OR = 2.39$ 4-5 moves					
$\beta = .24, p < .001, OR = 2.38$ 6-7 moves					
$\beta = .27, p < .01, OR = 2.24$ 8+ moves					
(p 's < .05; male, race, mother's ed, fam income)					
(p 's = ns; # sibs, recency & distance of last move; family type & moves: 2 bio parents & 0, 1, 2-3, 4-5, & 6-7 moves; other family types & 0 moves)					
(multiple logistic regressions)					
School Discipline					
Costonbader & Markson	1998	Concurrent group comparisons	Convenience: recruited middle & high school students from 4 schools in 2 inner-city (33%) & small rural town (67%) school districts	209	7th-10th gr
				N/R	48%
				Ethnicity	Result
				23% AFA 2% AFA 50% Cauç 8% Hisp 3% N/A 7% N/R 8% Other	One-third of the middle & high school students surveyed about their experiences with internal & external school suspensions reported that being suspended was "not at all helpful" for solving their problems & that they probably would be suspended again. 36% of these students reported suspension helped "a little," 12% "a lot," & 19% endorsed the item "I learned a lesson & I will never be suspended again."
Average Rate of Problem Behavior per Minute					
California					
3.40 baseline (BL)					
4.17 social skills training (SS)					
2.15 direct intervention (DI)					
1.57 followup (FU)					
PMD: 56% DI, 83% FU (3 mths)					
PMD = % of nonoverlapping data points: BL-DI, FU					
Recess					
1.42 BL, 1.39 SS, 0.61 DI, 0.68 FU					
PMD: 63% DI, 50% FU (2 mths)					
Transition					
6.08 BL, 5.74 SS, 3.82 DI, 2.5 FU (1 mth)					
PMD: 20% 1st half, 60% 2nd half DI, 100 FU					
*2nd half followed a change in strategy					
(no other statistics reported)					

Broader Social Environment, Communities, and Schools—Schools Tracking

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Farmar	1993	Prospective longitudinal 16 yrs	Population: located children in the National Child Development Study (NCDS), which included "nearly all children" born in Great Britain the 1st week of March, 1958	2,996	7 > 11, 16, 23 yrs	100%	N/R	N/R	Boys in the top 10% for parent or teacher ratings of externalizing were more likely to be in low-ability tracks & less likely to be in high-ability tracks, taking into account academic ability, parents' interest in education, family background & difficulties, & receipt of special education.	Track Placement, Externalizing $p < .0001$ M's = -.22 ext, .47 nonext. High-ability group M's = .40 ext, .18 nonext. Low-ability group (model included academic ability, family background & difficulties, parent interest in ed, special ed too) (no other statistics reported); OLS regressions
Gamoran, Nystrand, et al.	1995	Concurrent correlational data collected over 1 yr; T1 not used to predict T2	Convenience: recruited students from 92 honors, regular, & remedial English classes in 10 junior high/middle schools & 8 high schools in 7 Midwestern communities	1,564	8th–9th gr	50%	Low-upper middle	19% AHA or Hispanic 81% N/R	Classroom observations of remedial English literature students found more off-task behavior & lower engagement (% of reading & writing completed) than in regular or honors classes. Remedial classes had lower achievement than regular or honors classes, controlling for prior reading & writing scores, ability, SES, gender, & minority status.	Class Level Off-Task Classroom Behavior M's = 2.04 honors, 4.08 regular, 6.84 remedial Class Level % Reading Completed M's = 87.8 honors, 82.0 regular, 80.4 remedial Class Level % Writing Completed M's = 91.3 honors, 84.7 regular, 82.6 remedial (F values not reported, all p 's < .05) Achievement $\chi^2 = 55.89^*$ vs. 66.32** = 10.73, $p < .01$ Intercepts = -1.71 hon, -2.55 reg, -3.70 remedial *background effects constrained to be equal across class, sex, minority, SES, full reading & writing scores, ability **intercepts constrained to be equal (structural equation models)
Jones, Vanfossen, & Ensminger	1995	Concurrent correlational	Convenience: from High School & Beyond data set, a 2-stage probability sample from 1,100 high schools, oversampled for race & private/Catholic school, random sample of 36 students per school	N/R 30,000 data set	10th gr	N/R	N/R	N/R	The likelihood of being in the academic versus general track decreased for students who came from low-SES families or low-SES neighborhoods; who were Hispanic, male or nonblack; or who had lower grades, ability, or educational aspirations.	Predictors of Academic vs. General Track $\beta = .30$, OR = 1.34 individual SES $\beta = .12$, OR = 1.12 school SES $\beta = -.04$, OR = 0.96 Hispanic $\beta = .05$, OR = 1.05 ability $\beta = -.40$, OR = 1.50 educational aspirations $\beta = -.22$, OR = 1.24 grades $\beta = .7%$, OR = 2.10 black $\beta = .007$, OR = 10.20 female (p 's < .001) (model included school ability, inclusiveness, & individual x organizational interactions) (multinomial logistic regression)

Broader Social Environment, Communities, and Schools—Schools Class & School Size

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Altenheim	1995	Concurrent correlational	Population: nationally represent- ative sample of students; 24,000 8th graders from 1,052 public & private schools; only public schools included in this study; U.S. Dept. of Education, National Educational Longitudi- nal Survey, 1988	4,973	8th gr	50% approx N/R	Low-upper	N/R% AYA N/R% AsnA N/R% Cauc N/R% Hisp N/R% NUA	Larger class size was associated with higher achievement scores in math & English, taking into account teacher, family, & community variables, but not ability. However, smaller classes had more low-ability students. When ability was taken into account, smaller class size was associated with higher history & science scores. Class size had a smaller effect than most family, teacher, or community variables, including parents' education. Decreases in class size contributed to small increases in test scores.	Achievement Scores Math $F = 74$, $R^2 = .18$ ($n = 4,741$) $\beta = .12$, $t = 6.25$, $p < .05$, $M = 24.2$ class size English $F = 71$, $R^2 = .17$ ($n = 4,973$) $\beta = .08$, $t = 7.71$, $p < .05$, $M = 24.3$ class size History $\beta = .03$, $t = 1.91$, $p < .10$ ($n = 4,850$) ($p = ns$: science) Low Ability & Class Size Math $t = 13.20$, M's = 24.8 nonlow, 21.4 low (p's $< .05$: English, science, history) Achievement Scores, Endogeneity of Class Size Science $F = 50$, $R^2 = .13$ $\beta = -.08$, $t = -5.40$ class size $\beta = 1.23$, $t = 9.00$ parent education ($p < .05$ history; p's = ns: math, English) (models included family income & composition, race, parent education, urban, preschool, % single-parent families, gender, teacher race, years experience, class size) Change in Class Size, Change in Scores $M = 25$ to $M = 15$, +.8 science, +.7 history (COLS regression, 2 SLS regressions)
Lee & Smith	1997	Prospective longitudinal 4 yrs 3 waves	Population: nationally represent- ative sample of students from 789 public, elite private, & Catholic schools; only students who attended same high school all 4 yrs with data from all 3 waves included here; U.S. Department of Education, National Educational Longitudinal Survey, 1988, NELS: 88	9,812	8th > 12th gr	49%	Low-upper	N/R% AYA N/R% AsnA N/R% Cauc N/R% Hisp N/R% NUA (Note: AsnA not a minority in this study)	Gains in reading & math achievement between 8th & 12th grades were highest for schools with moderate enrollment (600–900). Small schools (< 300) showed fewer gains, while very large schools ($> 2,100$) showed even fewer. School size had a greater effect on schools with lower SES & $> 40\%$ minority enrollment. Differences in math gains between low-SES schools & high-SES schools were greater in small & large than in moderate-size schools. Differences in math & reading gains between schools with low & high minority enrollment were greater in large ($> 1,600$—math; $> 1,500$—reading) schools.	Gains, Math & Reading Achievement, 8th–12th y's = $-.93$, math, $-.53$, $p < .05$ read : 300 y's = 1.5, math, $-.54$, $p < .05$ read 601–900 y's = -1.8, math, $-.91$, $p < .05$ read $> 2,100$ y = slope SES & gains (p's $< .001$ math; model: base estimate, average SES, minority enrollment, Catholic/private school, school size) SES & School Size, Difference in Gains 2.0 pts difference high to low SES 600–900 3.5 pts difference high to low SES < 300 5.0 pts difference high to low SES $> 2,100$ Minority Enrollment ($> 40\%$) & School Size, Gains Math (40 items) Reading (21 items) 1.0 pt 600–1,200 1.0+ pt 600–1,200 2.5 pts 1,800–2,100 2.5 pts 1,500–1,800 3.5 pts $> 2,100$ 3.5 pts 1,800–2,100 < 1.0 pt < 600, $> 2,100$ (hierarchical linear modeling)
McGivern, Girman, & Tillack	1989	Meta-analysis intervention PRIME TIME nonrandom	Convenience: schools in randomly selected school districts, IN; IV led to reduced class size for 6 of 9 schools	24 scores	1st–2nd gr	N/R	Low-middle $M = \$17k$ – $\$23k$ $M = 12.3$ yrs ed 6–10% poverty	N/R% Cauc N/R% Other "majority" Cauc	Academic achievement (reading, math, & composite scores) was higher in classes that experienced the PRIME TIME intervention to reduce class size, than in classes that had not been reduced.	Class Size Reduced ($M = 19.1$ students/class) $\chi^2 = 190.45$, $df = 40$, $p < .001$ $d = .34$, 95% CI = .09–.59 Class Size Not Reduced ($M = 26.4$ students/class) $\chi^2 = 6.75$, $df = 40$, $p > .05$, $d = -.15$ (Fischer inverse χ^2)

Broader Social Environment, Communities, and Schools—Schools

School Social Dynamic

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Rodun, Farmer, et al.	2000	Concurrent correlational	Convenience: recruited children from 31 Chicago classrooms (inner-city to suburban) & 28 North Carolina classrooms (rural & small city); classrooms were chosen to include students with disabilities	452	4th–6th gr	100%	N/R	40% Afr 54% Cau 6% Hisp	Teacher ratings of interpersonal competence yielded configurations of popular (Toughs) & unpopular (Bright Antisocial, Troubled) aggressive boys. Configurations of non-aggressive boys included Model (popular-prosocial), Low Academic, & Passive (average popular). Tough & Model boys received the highest peer nominations for "cool" & "attractive"; Tough & Troubled boys had the highest scores on antisocial behavior, & Tough boys had the highest self-ratings of popularity. Tough & Model boys were more often nuclear or central members of social networks, while Troubled boys were more often found in less central roles (isolated or peripheral).	Configural Analysis From Teacher Ratings Tough: 1.3 egg, 0.46 pop, 0.31 phys, 0.02 aff (+) 0.38 acad, 0.27 int, 0.85 shy (-) Bright AS: 0.64 egg, 0.39 acad, 0.34 int (+) 0.80 pop, 0.66 phys, 0.64 aff, 0.21 shy (-) Troubled: 1.04 egg, 0.52 int, 0.13 shy (+) 0.98 pop, 0.78 phy, 1.1 aff, 1.35 acad (-) Peer Ratings: Wilks's $\Lambda = .45$ $\text{Approx } F(35, 1853) = 11.1, p < .001$ Cool: +.46 Tough, +.26 Model (-.16 to -.28 rest) Abt: +.47 Tough, +.28 Model (-.06 to -.32 rest) Self Ratings: Wilks's $\Lambda = .70$ $\text{Approx } F(35, 1824) = 4.64, p < .001$ Pop: +.44 Tough (+.07 to -.19 rest) (MANOVAs, univariate F's not reported, p's < .05) Configurations & Centrality $\chi^2(15, N = 452) = 31.6, p < .01$ Nuclear: 64% tough, 62% model, 51% line Isolated: 15% troubled, 6.2% baseline Peripheral: 13% troubled, 7.7% baseline (log linear analysis)
Xie, Cairns, & Cairns	1999	Concurrent correlational	Convenience: recruited children from 1 elementary & 3 middle schools in high-crime inner-city areas of a large Southeastern city	506	4th–7th gr 10–16 yrs	42%	N/R 1/3 of families in school district below poverty line	100% Afr	Boys & girls affiliated with social networks having similar configurations of teacher-rated interpersonal competence factors: aggression, popularity, affiliation, physical competence, & academic competence. Individuals in the risk configuration (high on aggression & low on academic competence, physical competence, popularity, & affiliation) were more likely to affiliate with a social network of at-risk peers. In addition, boys who were nominated by peers as highly central to their social networks were rated by teachers as more aggressive than boys with median or low centrality. For girls, greater social network centrality was related to higher teacher ratings of popularity, not aggression.	Individual Configurations 35% high competence: low egg, high rest 40% average competence: median all 25% risk: high egg, low rest of factors Social Network Configurations Average scores of peers in group 36% high competence: low egg, high rest 45% average competence: median all 19% risk: high egg, low rest of factors Individual Configurations & Social Networks Mantel-Haenszel χ^2's not reported, p's < .05 proportions for gr 4 & 5 girls shown in figure but not reported in text; four analyses conducted: boys, girls, 4th & 5th gr, 6th & 7th gr Aggression & Social Network Status, Boys $F(2, 209) = 5.14, p < .01$ M's = 4.43 high central, 3.55 med, 3.27 low Popularity & Social Network Status, Girls $F(2, 277) = 11.00, p < .001$ M's = 5.12 high central, 4.72 med, 4.21 low (ANOVA, no post hoc tests)

Broader Social Environment, Communities, and Schools—Schools Teacher-Student Interactions

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Kellam, Ling, et al.	1998	Prospective longitudinal 5 yrs	Population: children from 18 public elementary schools in 5 areas of E. Baltimore; schools & teachers were randomly assigned to IV/control classrooms; students were assigned sequentially to 1st- gr classrooms balanced for kindergarten aggression & remained in classroom 1st & 2nd grades	403	1st > 6th gr	50%	Low-middle 46% in school lunch program T1	64% AfrA 29% CauC 7% Other T1	Boys 1st Grade on 6th Grade Aggression ($n = 202$) OR = 1.30, CI = 0.85–1.98, $p = .ns$ individual aggress OR = 0.07, CI = 0.01–0.61 classroom aggression OR = 2.27, CI = 1.08–4.77 1st x classroom aggress OR = 1.07, CI = 1.32–6.47, $p < .01$ classm poverty HI-Aggression vs. Low-Aggression Classrooms OR = 1.7–58.7 vs. OR = 1.1–2.7 Girls 1st Grade on 6th Grade Aggression ($n = 201$) OR = 1.75, CI = 1.03–2.97 individual aggression OR = 10.83, CI = 1.36–86.15 classroom poverty (p 's < .05 unless noted) * Classroom aggression: Mean aggression score of children in classroom (teacher-rated). Classroom poverty: % of students in the classroom who receive a free lunch (hierarchical linear regressions)	Boys 1st Grade on 6th Grade Aggression ($n = 202$) OR = 1.30, CI = 0.85–1.98, $p = .ns$ individual aggress OR = 0.07, CI = 0.01–0.61 classroom aggression OR = 2.27, CI = 1.08–4.77 1st x classroom aggress OR = 1.07, CI = 1.32–6.47, $p < .01$ classm poverty HI-Aggression vs. Low-Aggression Classrooms OR = 1.7–58.7 vs. OR = 1.1–2.7 Girls 1st Grade on 6th Grade Aggression ($n = 201$) OR = 1.75, CI = 1.03–2.97 individual aggression OR = 10.83, CI = 1.36–86.15 classroom poverty (p 's < .05 unless noted) * Classroom aggression: Mean aggression score of children in classroom (teacher-rated). Classroom poverty: % of students in the classroom who receive a free lunch (hierarchical linear regressions)
Thurlow, Ysseldyke, et al.	1993	Concurrent correlational students observed 1 time over 1 yr	Source specific: students in special education & regular services, 27 schools, 8 school districts; 114 learning disabled, 19 emotional/ behaviorally disturbed, & 6 educable mentally retarded students	139	1st–6th gr	66%	N/R	N/R	Qualitative & quantitative aspects of instruction in special education classrooms showed improvements with smaller student-teacher ratios. Observations of teacher instruction found that relevance of assigned tasks, feedback from teachers, & checking for student understanding were greater in classes with smaller ratios. Similarly, students in classes with smaller student-teacher ratios had higher academic responding & academic engaged times, & they spent less time on task management & teacher tasks.	Task Relevance $\chi^2 = 20.46$, $p = .0004$ ($n = 106$) M 's = 3.59, 3.43, 3.08, 3.10, 3.23 Checking Student Understanding $\chi^2 = 20.74$, $p = .0004$ ($n = 105$) M 's = 3.47, 3.19, 2.77, 2.95, 2.70 Feedback ($n = 107$) $\chi^2 = 15.06$, $p = .005$ M 's = 3.56, 3.36, 2.94, 3.12, 3.24 % Academic Responding $F = 13.09$, $p = .000$ M 's = 67%, 55% vs. 44%, 35%, 28% % Academic Engaged $F = 4.92$, $p = .001$ M 's = 95% vs. 84%, 83%, 80%, 81% % Time on Task $F = 4.00$, $p = .004$ M 's = 9.5% (3.1) vs. 34% (12.1) (order of ratios for M 's: 1:1, 3:1, 6:1, 9:1, 12:1) ($df = 4$, 134; followup set at $p < .006$) (statistics not reported)
Van Acker, Grant, & Henry	1996	Concurrent group comparisons	Convenience: students above median for risk of aggression, 2 inner- city & 2 metro area Midwest schools; Metropolitan Area Child Study control schools	206 students 25 teachers	2nd, 3rd, 5th gr	59% students 18% teachers	N/R	56/20% AfrA 11/66% CauC 31/11% Hisp 3/2% Other (students/ teachers)	Teachers gave more reprimands, fewer opportunities to respond academically, & more behavioral requests to students at high risk for aggression than mid-risk students.	Mean Rate per Minute, Teacher Behavior Teacher reprimands $p < .01$; $M = .047$ mid-risk, .074 high-risk Opportunities to respond academically $p < .05$, $M = .025$ mid-risk, .019 high-risk Behavioral requests $p < .01$; $M = .058$ mid-risk, .074 high-risk (t tests, Bonferroni correction)
Webb, Dodge, & Valente	1993	Prospective longitudinal 15 mths observed 30 mins, 4x, over 2 mths	Convenience: students chosen from larger study. Southeast, 3-stage screening for risk: school, class, parents	82	K > 1st gr	57%	N/R	52% AfrA 48% CauC	Children identified in kindergarten as at high risk for developing conduct problems were given more negative commands in structured & unstructured settings by their 1st-grade teachers than low-risk students.	Mean Rate per Minute, Teacher Behavior Teacher negative commands, structured activity $F = 2.07$, $p < .05$; M 's = .066 high, .033 low Teacher negative commands, unstructured activity $F = 2.30$, $p < .03$; M 's = .047 high, .025 low (MANOVA, planned contrasts, t tests)

Broader Social Environment, Communities, and Schools—Schools

School Bonding & Attachment

Authors	Year	Design	Representativeness	Size	Age	% Male	SES	Ethnicity	Result	Key Statistics
Abbott, O'Donnell, et al.	1998	Intervention nonrandom 2 yrs spr 1985 pre fall 1985 pre spr 1987 post	Convenience: consenting 5th grade students (76%) in 18 public schools, high-crime areas, Seattle; part of a longitudinal study of 1st–6th-gr intervention; 20 classrooms in 10 schools IV, 18 classrooms in 8 schools controls; 1985–1987	808	spr 4th > spr 6th gr	51%	Low-middle for school lunch program	24% Af/A 46% Cau 21% As/A 9% Other	Greater implementation of targeted teaching strategies, classroom management, interactive teaching, & cooperative learning resulted in greater student-reported bonding to school, involvement in the classroom, & opportunity for reinforcement of classroom involvement. IV group students also had higher CAT achievement scores at the end of 6th grade (controlling for 5th-grade CAT) but showed no differences on school bonding variables when implementation was not examined.	Academic Achievement—CAT $\chi^2 = 63.3$ ($df = 36$), $p = .004$; $f = 2.69$, $p < .05$ $M's = 537.06$ IV, 527.64 control Bonding to School—Implementation Score $\chi^2 = 222.7$ ($df = 41$), $p = .001$; $f = 2.23$, $p < .05$ $M's = 222.7$ IV, 212.64 control Opportunity for Involvement—Implementation $\chi^2 = 220.9$ ($df = 36$), $p < .01$; $f = 3.14$, $p < .01$ Actual Involvement—Implementation $\chi^2 = 106.5$ ($df = 41$), $p = .001$; $f = 2.49$, $p < .01$ Reinforcement Involvement—Implementation $\chi^2 = 244.3$ ($df = 41$), $p = .001$; $f = 2.36$, $p < .05$ $M's$ not reported for high & low implementation (controlling for 5th-grade baseline scores) (t test, hierarchical linear modeling, Bayes estimation)
Hawkins, Catalano, et al.	1999	Intervention nonrandom 2- or 6-yr IV; 5th–6th or 1st–6th; 6-yr followup age 17: CAT achievement, court records; age 18: self-report	Convenience: consenting 5th-gr students (76%) in 18 public schools, high-crime areas, Seattle; 1/3 received IV since 1st-gr, 1/3 5th–6th-gr, 1/3 controls; 1985–1993	598 T2 643 T1	5th gr > 17/18 yrs	50%	Low-middle for school lunch program	25% Af/A 22% As/A 44% Cau 5% Na/A 3% Other	High school seniors in preventative intervention classrooms during 1st–6th grades reported more commitment & attachment to school, less school misbehavior, heavier drinking, or skipping a grade, & less lifetime violence, sexual activity, or pregnancy than students in control classrooms. Poorly interacted with intervention status. School attachment was higher for year IV students than year controls, fewer year IV than controls rescheduled a grade, & fewer working / middle-class IV students went to a woman pregnant than controls. The late IV (5th & 6th grade only) showed no treatment effects.	Bonding to School, School Commitment $p = .03$, $M's = 2.65$ IV, 2.50 control Bonding to School, School Attachment $p = .03$, $M's = 3.18$ IV, 2.94 control School Success/Failure, Repeated a Grade $p = .56$, $M's = 13\%$ IV, 32% control School Misconduct, Self-Report, Past Year ($n = 529$) $p = .02$, $M's = 3.66$ IV, 4.77 control Actual Use (10+ past yr) $p = .02$, 15% IV, 25% ctrl Lifetime Violence $p = .04$, 48% IV, 60% ctrl Lifetime Sexual Activity $p = .02$, 72% IV, 83% ctrl Lifetime Been/Got Woman Pregnant $M's = 27\%$ IV, 30% ctrl $M's = 5\%$ IV, 21% ctrl working/middle (student t tests for means, χ^2 for prevalence rates)
Jenkins	1997	Concurrent correlational	Convenience: recruited students from middle school in DE; urban & suburban areas, 83% participation	754	7th & 8th gr 11–15 yrs	50%	Low-middle for school lunch program	22% Af/A 66% Cau 3% As/A 5% Hisp 4% Other	Components of the school social bond predicted self-reported school delinquency. Educational commitment & belief in school rules directly predicted school crime (drug use, vandalism), school misconduct (cheating, talking in class), & school nonattendance (cutting or tardiness, class or school). Attachment to school directly predicted misconduct & nonattendance. Involvement in school activities was an indirect predictor of school delinquency, through the school social bond.	School Crime $R^2 = .32$, $p < .05$ $r = -.35$ educational commitment $r = -.23$ belief in school rules $r's = .13$ sibling at school, .14 male School Misconduct $R^2 = .29$, $p < .05$ $r's = -.26$ ed commit, $-.15$ belief, $-.26$ attach $r's = .07$ family size, .18 male School Nonattendance $R^2 = .29$, $p < .05$ $r's = -.36$ ed commit, $-.12$ belief, $-.16$ attachment $r = .08$ family size (see study for results with indirect predictors: parental involvement in school, mother's education, grade, ethnicity, male, math ability, living w/step-parent) (path analysis)

Synthesis and Epilogue

This review of empirical studies was guided by two objectives: (1) to identify the significant risk factors associated with externalizing behavior problems; and, (2) to estimate the likelihood that each factor influences the occurrence of externalizing behavior problems. In pursuing these objectives, an evaluative framework developed by Kraemer et al. (1997) was used to categorize factors as correlates, predictive risk factors, or causal risk factors based on the scientific evidence to date. Three important lessons were learned quickly. First, research in this area has blossomed in the past decade, resulting in hundreds of empirical papers covering a wide range of possible factors. Second, while a number of significant causal risk factors have been identified (i.e., child hostile attributional processes; parental engagement, validation, and discipline; peer rejection and association with deviant peers), a number of factors have empirical support as predictive risk factors and many more have been identified as concurrent correlations. Third, many researchers have moved beyond a simple risk-factors perspective, driven by findings that pointed to a more complex and richly textured view of children and how they develop from infancy through early adulthood.

The preceding sections of this report have, with some exceptions, stayed close to the original objectives, focusing in turn on each of the many factors discussed in this literature. It is important, however, to expand on these objectives to take into account the complexity of externalizing behavior problems and to encourage the next generation of empirical studies. This expansion includes: (1) the importance of defining externalizing behavior in developmental terms; (2) the need to "put the

organism back together" in considering individual child characteristics as they relate to risk and protection; (3) the problem of "correlated environments" and their implications; and (4) the necessity of studying child characteristics and environmental factors in concert.

Defining Externalizing Behavior in Developmental Terms

The past decade has seen a movement from defining externalizing behavior problems as isolated acts or static traits to defining externalizing behaviors as an organized system of responses that emerges, grows, and changes over the course of development. These responses are multifaceted, including not just overt actions but also patterns of thinking and feeling (e.g., hostile attributions, irritability). To completely characterize externalizing behavior problems, researchers must describe not only the kinds of actions, thoughts, and emotions involved, but also how they are interrelated and how these interrelated patterns develop and change over the months and years from infancy through childhood, adolescence, and early adulthood. While a number of recent longitudinal studies have given some initial picture of these developmental "trajectories," "pathways," or "reorganizations," a great many questions remain unanswered. For instance, there are questions about continuity and discontinuity (Which young children remain aggressive throughout childhood, and which do not?) and questions about reorganization of behavior (Which aggressive children later become bullies, which

later become involved with drugs, and which become prosocial and lose their aggressiveness?). Given the richness of some of the existing longitudinal studies, some of the questions may be answerable through secondary data analysis.

This more dynamic view of externalizing behavior problems already has had important implications for studying risk factors. Etiology becomes more complicated. A factor that *leads to* early aggressive behavior may not have as great an effect on later conduct problems. A factor that *maintains* conduct problems may have had little to do with the initial onset. A factor that leads to *desistance* from delinquency may have had nothing to do with either bringing about or maintaining the behaviors in the first place. And a factor that puts one child at risk for externalizing behavior in one context may actually *protect* another child from developing that same behavior in another context.

Putting the Organism Back Together in Considering Individual Child Characteristics

A substantial number of studies have focused on the question, what is it about individual children that puts them at risk for engaging in externalizing behavior? Researchers have studied a range of individual characteristics that span multiple levels of analysis within the child, including neurotransmitters, neurohormones, physiology, cognitive processes, expression of emotion, and patterns of behavior. They have developed better and better ways to study these various components of child functioning and have greatly increased our understanding of such characteristics. While such work needs to continue, there is a growing need to develop complementary studies that will expand this focus in two directions.

First, most of the studies reviewed here examine these individual child factors only in relation to

single points in time in the development of externalizing behavior problems (e.g., difficult/irritable temperament in young childhood, hostile attributional processes in elementary school-aged children). A few studies have begun to place these factors in a developmental context, studying how such characteristics change with development and are involved in trajectories for externalizing behavior.

Second, most studies to date have restricted their focus to one child characteristic, studying how that characteristic is related to externalizing behavior but providing no information about relationships among different characteristics. Research that attends to more than one characteristic will be important for two reasons. When two or more characteristics are implicated as risk factors, understanding how these systems influence one another is essential in learning how to treat or prevent such behavior. For example, social information processing may shape emotion regulation, emotional regulation may shape social information processing, or the two may reciprocally influence one another or be controlled by a third unknown process. Understanding the nature of these links will help people ascertain whether interventions that target social information processing will be effective independent of any attention to emotion regulation, or whether both need targeting. The latter strategy may be essential if these two systems influence one another.

In addition, cross-characteristic studies can help identify risk factors that moderate other child factors and account for meaningful increases in risk. For example, neural processes related to ADHD may constrain social information processing, which, in turn, increases the child's risk for externalizing behavior problems. Not only might social information processing interventions be the best way of approaching such cases, but such interventions may require tailoring when used with children with ADHD.

Studying Correlated Environments

This review found that a wide range of environmental factors from a variety of social contexts are likely to influence the developmental course of externalizing behavior problems. Single variables by themselves do a poor job of describing the environments that influence developmental pathways. In addition, the variables we use to describe these environments often co-occur with one another, both within and between social contexts. Recent literature uses terms such as "correlated constraints," "correlated environments," or "bundled risk factors" to describe such co-occurrence. These findings have important implications for research and effective intervention.

- Simple risk factor studies have played an important but more preliminary role in the field. They provided initial evidence about where attention needed to be focused. Now, research on environmental risk factors needs to move to describing environments in more complex ways. Indeed, this review organized environmental factors into three primary areas—family, peer, and the broader social environment. Many correlations and predictive risk factors were identified in each area, as well as several noted causal risk factors. Research now must build on this foundation by examining how factors within and across these areas converge to increase or decrease risk for conduct problems at various phases of development.
- Interventions that focus on single environmental risk factors are very likely to be compromised by hidden constraints, threshold problems, and even boomerang effects. *Hidden constraints* are linked risk factors that are overlooked. For example, parent training programs may fail to change important parenting behaviors

because they fail to appreciate the constraints on parenting imposed by parental depression, interparental conflict, work, or economic conditions. *Threshold problems* occur when interventions fail to target a broad enough array of important factors. For example, programs that target only reductions in conduct problems may not reach a threshold for effectiveness if they do not also include training in how to carry out prosocial alternatives. *Boomerang effects* occur when interventions to reduce one risk factor actually enhance other risk factors. For example, interventions that bring children with conduct problems together in groups to work on social skills may inadvertently enhance the formation of self-reinforcing deviant peer groups.

Recent studies have made some headway, suggesting important directions for studying correlated environments and their effects.

- Studies involving *more comprehensive assessments* of the child's developmental context find important continuities across aspects of the environment. For example, various dimensions of parenting behavior tend to co-occur (validation, monitoring, engagement, discipline) (Barnes, Farrell, & Banerjee, 1994; Farrington & Hawkins, 1991; Haapasalo & Tremblay, 1994; Patterson, Chamberlain, & Reid, 1982; Sampson & Laub, 1994; Scaramella, Conger, & Simons, 1999; Simons, Johnson, Conger, & Elder, 1998; Wasserman, Miller, Pinner, & Jaramillo, 1996).
- Studies that include *measurement of more than one social context* also find cross-context links (Borduin et al., 1995). For example, parenting patterns are related to peer relationships (Aseltine, 1995; Dishion, Duncan, Eddy, Fagot, & Fetrow, 1994; Schwartz, Dodge, Pettit, & Bates, 1997), and communities may reinforce local friendship networks that enhance the operation of these effects (Brody et al., 2001; Sampson, Raudenbush, & Earls, 1997).

- Studies that include *assessment of broader social factors*, such as regional economic conditions or density of local friendship networks, find that these factors can place constraints on peer and family contexts in ways that are related to externalizing behavior problems. In some cases, these constraints can even eliminate the association between such context factors and externalizing. For example, there is evidence for cultural variation in the effects of parenting on externalizing, such that some parenting variables are related to externalizing in Caucasian families but not in African-American families (Deater-Deckard, Dodge, Bates, & Pettit, 1996)

Studying Child Characteristics and Environmental Factors in Concert

While the study of child factors and environmental risk factors has proliferated, evidence is emerging to suggest that these two domains must be studied together. Three sets of findings demonstrate this, suggesting important directions for future work.

- *Child behavior both shapes the child's environment and is a response to that environment.* A number of recent studies suggest that trajectories of child development are shaped by patterns of reciprocal influence between the child and the child's social context. Negative emotionality in the infant and young child increases the likelihood of parental hostility and rejection, which in turn increases negative emotionality (Shaw et al., 1998). Conduct problems in middle childhood reduce effective parenting (discipline, monitoring, validation), which reinforces antisocial behavior (Simons et al., 1998). Reduced parental monitoring and warmth in late childhood increases the risk of delinquency, and increased delinquency reduces monitoring and warmth (Jang & Smith, 1997). Recent studies of evocative gene-environment correlations further support the thesis that a range

of child characteristics both shape and are shaped by social context (Ge et al., 1996; O'Connor, Deater-Deckard, Fulker, Rutter, & Plomin, 1998).

- Social contexts can have different effects on the developmental trajectories of different children, depending on what the children bring to the context. Several studies now suggest that specific environmental factors may be risk factors for some children, have no effect on others, and be protective factors for still others. For example, high levels of parental control appear to increase risk for children with one temperament but protect children with a different temperament (Bates, Pettit, Dodge, & Ridge, 1998). Again, these patterns also appear in behavioral genetics studies, indicating that heritable child characteristics and particular environmental factors interact in influencing the developmental trajectories of externalizing behavior problems (Cadoret, Yates, Troughton, Woodworth, & Stewart, 1995).

- These two patterns, *reciprocal effects* and *child-environment interaction effects*, must also be considered in a developmental context. There is evidence that the reciprocal effects between child conduct problems and lax parental monitoring are strongest before age 15 and that in later adolescence it is delinquency that leads to lax monitoring (Jang & Smith, 1997). Similar fading of reciprocal effects may occur for conduct problems and poor parental disciplinary practices, with the latter much more likely to drive the former in late adolescence (Cohen & Brook, 1995). This change may also be concomitant with increasingly reciprocal effects among antisocial adolescent peers.

Implications for Future Research

The four issues discussed above reflect the progress of a scientific field as it grapples with the complexities of human development. Investigators

concerned with externalizing behavior problems are moving beyond simple risk factor studies into the study of *risk and protective mechanisms* that not only explain variance in predicting outcomes, but also suggest malleable processes that can be tested for causality and become targets for intervention. These risk mechanisms are developmental and appear to involve more complex interactions between organism and environment, which themselves change in potency over the course of development.

Acknowledging and truly taking into account this complexity will be the task of the next generation of risk research in externalizing behavior problems. Indeed, several recent studies have moved in this direction by studying how selected child factors interact with specific environmental factors at critical points in development and examining how patterns among these factors affect the development of externalizing behavior problems (Conger et al., 1992; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Henry, Caspi, Moffitt, & Silva, 1996; Pettit, Bates, Dodge, & Meece, 1999; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). These initial studies are taking on the challenge of reducing the now-overwhelming four-plus-dimensional matrix (resulting from the intersection of child, family, peer, broader social environment, and development) to workable sets of multiple factors that hold significant power for predicting risk and revealing stronger groupings of causal risk factors for externalizing behavior problems.

What can be used to guide this complex and challenging work? The research reviewed here suggests four strategies for advancing research on risk factors and interventions for externalizing behavior problems.

- Several important factors have been identified as causal risk factors, including child hostile attributional processes; parental engagement, validation, and discipline; and peer rejection and

association with deviant peers. It is critical that these findings be disseminated to the public and that effectiveness research be conducted with the intervention strategies known to affect these factors to ensure appropriate implementation by communities, schools, and mental health service systems.

- The framework provided by Kraemer et al. (1997) suggested that research on risk factors relevant to developing interventions can follow a developmental course of its own. Once factors are found to be correlated with outcomes, further research should document the potential for prediction and, ultimately, the potential for causation. The current review identified a number of predictive risk factors and concurrent correlations with externalizing behavior problems. It is critical that this research be advanced (i.e., that concurrent correlations be tested for predictive risk and effect size, and that potent predictive risk factors be tested for potential causality). This type of research will provide the foundation for developing more effective interventions.

- Studying multiple factors simultaneously is critical for furthering intervention and risk factor research. Simple risk factor studies have played an important role, but the field must advance to describing, measuring, analyzing, and experimentally intervening with child factors and environments in more complex ways.

- A developmental perspective will need to be incorporated into all research. Externalizing behavior problems have a developmental course, and it is likely that the risk factors and mechanisms that lead to this development also change over time. In particular, it is important to know if there are particular points in development when specific risk factors converge to substantially increase vulnerability or when there are windows of opportunity for intervention.

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